

Installers' handbook

Preface

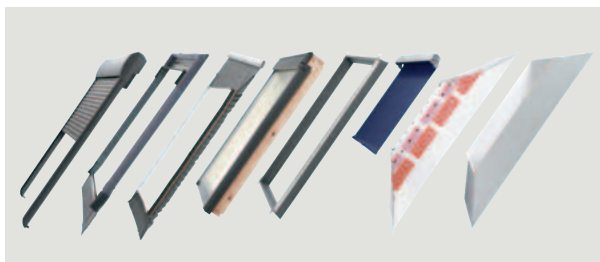
The purpose of this handbook is to provide an overview of the installation of VELUX products.

The handbook describes the various aspects of roof construction in association with VELUX roof windows and also provides advice and information on how to obtain the optimal installation.

(Third edition, 2010)

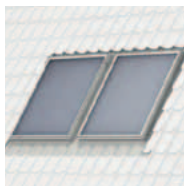
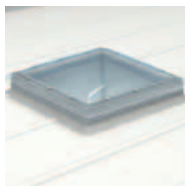
The VELUX system

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Planning

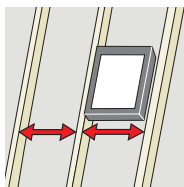
The construction of the house

To be able to choose the right VELUX roof window for a given situation, it is always recommended to start from the construction of the house, user requirements and current building regulations.

Normally, a standard VELUX roof window can satisfy the basic requirements, but often choosing another window type or variant and/or choosing accessories can optimise the function and increase the utility value of the window.

Planning must include the following aspects:

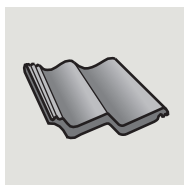
The distance between the rafters in the roof construction usually decides the size of the windows if cutting them and installing trimmers is not an option. Therefore, first check whether the position chosen and size of the roof windows fit into the existing roof construction or if rafters will need cutting (see pages 16, 48).



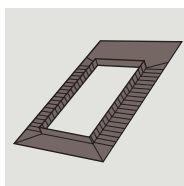
The roof pitch is important when choosing windows and flashings. As a rule, VELUX products can be used in roof pitches from 15° to 90°. However, there are exceptions so always check whether the products chosen can be used in the roof pitch in question (see chapter 8).



The roofing material decides the type of flashing to be installed around the window to ensure a watertight installation. The different flashing types are described in chapter 8, pages 124-126.



When there is underfelt in the roof construction, a tight connection must be established between the underfelt and the window frame to keep out water and driving snow. The easiest solution is VELUX underfelt collar BFX (see page 21).

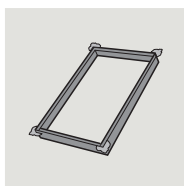


Planning

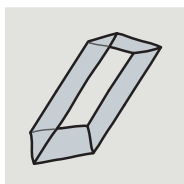
The construction of the house

1

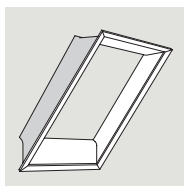
When the window is installed, insulation is required to be provided around the frame to allow for continuity of the insulation level in the roof. The easiest and most effective solution is VELUX installation set BDX (see pages 19, 103).



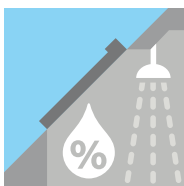
It is essential that the vapour barrier in the roof construction be connected to the window. The easy and effective solution is VELUX vapour barrier collar BBX (see pages 25, 104-105).



A connection must be established from the window frame to the interior ceiling finish either in the same materials as the interior ceiling finish or by installing a VELUX lining (see pages 25, 59, 130-131).



In some environments, such as rooms with high levels of humidity, there are special requirements for the window. The correct choice in these cases would be VELUX polyurethane windows (see page 115).



VELUX recommends insulating glass units with laminated glass on the inside for roof windows installed at high level above areas where people sleep, play or work. In case of breakage, the lamination holds fragments together (see page 136-137).

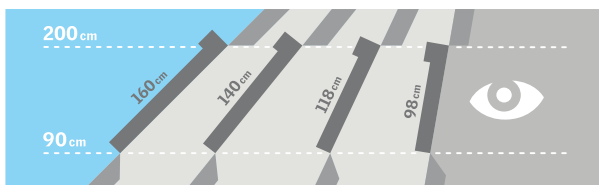


If there is a need for extra protection against solar heat, VELUX offers insulating glass units as well as internal and external blinds, awnings and shutters with particularly good heat reducing qualities (see pages 134-137).



Planning

User requirements



Try to allow for a clear view when standing and when seated. Note that the optimum window size depends on the roof pitch.

Centre-pivot windows make it possible to place furniture directly below the window without obstructing operation of the window.



Top-hung windows make it possible to stand upright under the open window while looking to the sides, providing extra head-room and maximising the feeling of extra space. These windows are also suitable for emergency escape/access purposes.



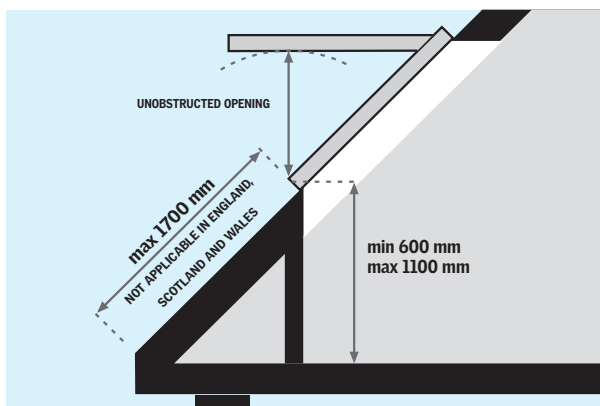
If the window is placed out of reach, consider electrical or solar operation that makes it possible to operate the motor for window opening/closing as well as interior and exterior sunscreening products with a remote control (see page 110).



MEANS OF ESCAPE

If specified for emergency escape purposes the roof window must have an unobstructed opening of not less than 0.33 m^2 with neither the width nor the height less than 450 mm.

The sketch shows the position of the window within the roof plane.



Roof windows which meet the requirements;

GPL M06, M08, P10, S06, U08

GPU F06, M04, M06, M08, P10, S06, U08

GHL/GHU M06, M08, S06

VFA/B M34, M36, M38, P34, P36, P38, S34, S36, S38

Other sizes are also available.

MINIMUM SILL HEIGHT REQUIREMENTS

The bottom frame of an opening window must be positioned at least 0.8 m above floor level.

Restrictor locks can be used for centre-pivot windows with sills below this level.

If the window functions as a means of escape/access, the bottom frame must be positioned as shown on page 7.

VENTILATION

In habitable rooms fresh air must be admitted for the health and safety of its occupants. VELUX roof windows provide both purge (rapid) and background ventilation to meet these requirements. Additionally mechanical extraction is required in kitchen and bathrooms etc to rapidly remove large volumes of aqueous vapour.

Building Regulation requirements should therefore be checked as to the provision of the correct amount and type of ventilation for a room depending on its size and use.

REQUIREMENTS FOR DAYLIGHT

To provide adequate levels of natural light, VELUX recommends that the daylight area be at least 15 % of the floor area.

In Scotland every apartment must have a window or windows of an aggregate glazed area equal to at least 1/15th of the floor area of the apartment and situated in an external wall or roof.

SAFETY GLASS

The Building Regulations state that if glass is less than 800 mm from the floor then glazing units with safety glass must be installed. VELUX also recommends that where windows are installed at high level in eg public places, the inner pane be specified as laminated glass. This means that if the glass is broken the lamination will hold the glass in place preventing it from falling. This is of particular importance for schools, games halls, conference centres etc.

For optimum performance VELUX recommends the use of glazing variants --73, --60 and --65 (see pages 136-137).

SOUND INSULATION

To obtain sufficient sound insulation special requirements may be necessary both in connection with choice of window variant and with the installation (see also chapter 7, page 108).

REPLACEMENT OF WINDOWS

In some areas replacement windows come under the aspects of the Building Regulations. This means that application must be made to the Local Authorities before the work can commence.

FENSA registered companies can however carry out replacement work immediately and then register the work with the Local Authority on completion.

In all cases local planning requirements must be observed.

REQUIREMENTS FOR SAFETY AT WORK WHEN INSTALLING ROOF WINDOWS

H&S – WORKING AT HEIGHTS

In many cases VELUX roof windows may be installed from the inside so that working on the roof is avoided.

In some cases it is, however, necessary to carry out part of the installation from the outside, and in these cases it is important to take the necessary safety measures.

As a principal rule protective measures must be taken on building sites with a risk of drops of more than two metres. Therefore, when working on roofs an effective protection against falling is almost always necessary.

Scaffolding or a railing at the base of the roof may be a solution. If the work on the roof is brief, fall protection (safety belt with line/wire) may be used.

Which safety measures to be taken depend on the conditions on the building site and are the full responsibility of the person(s) involved in the work being carried out. The safety measures are described in detail at **www.hse.gov.uk**.

Installation of a roof window

2

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Installation of a roof window

Establishing opening

POSITIONING THE WINDOW IN THE ROOM

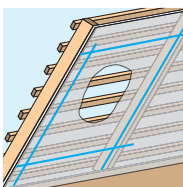
Position the window in the room considering:

- the use of the room
- a clear view when standing and/or when seated
- comfortable operation (centre-pivot or top-hung window)
- requirements regarding sill height, see chapter 1
- vertical wall, if any, see page 59
- optimum design of linings
- building regulation requirements



HOLE IN THE ROOF

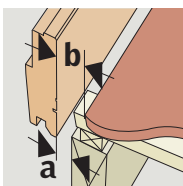
If there is no access to the roof from the outside, establish a hole in the roof surface by cutting a small hole, approx 400 x 400 mm, from the inside and through the roof construction. When battens have been cleared, the final position of the window in the roof construction can be determined. When measuring, remember to allow space for insulation around the window frame.



POSITION OF TOP, BOTTOM AND SIDE TRIMMERS – see chapter 4

POSITIONING THE WINDOW

If possible in order to minimise adjustment of the roofing material, adjust the position of the window sideways allowing for recommended distance to rafter (support) (a) and roofing material (b).



Installation of a roof window

Establishing opening

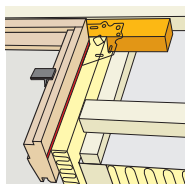
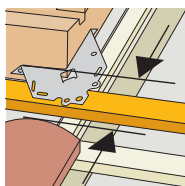
2

Adjust the position of the window upwards/downwards depending on type of flashing.

In roofs with:

- profiled roofing materials, allow for a full course of tiles below the window.
- slates, ensure necessary overlap between slates and flashing, see page 77 and installation instructions.

When deciding final position and dimensions of the hole in the roof surface, add 20-30 mm on all sides to allow for correct insulation around the frame. Define hole at top and bottom with installation battens and at sides with rafters as shown in the installation instructions.



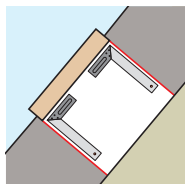
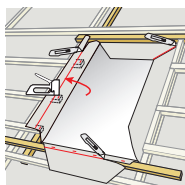
HOLE IN UNDERFELT AND CEILING FINISH

Roofing felt can be cut as shown and folded in order to ensure water tightness.

In a roof with an existing ceiling finish, project frame dimensions perpendicular to the ceiling finish and mark. Cut hole. It is necessary to cut a temporary hole in order to install window.

Note that it must be possible to re-establish the vapour barrier within the existing roof construction (if present) with the new vapour barrier around the window.

The final adjustments of the hole in the ceiling finish should not be made until installation of lining.



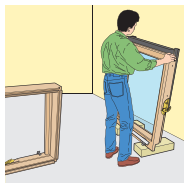
Installation of a roof window

Establishing opening

REMOVING SASH

If installing the window from the inside the sash must be removed.

Place the sash on a clean and even surface. Installations from the outside can be carried out with the sash in place.

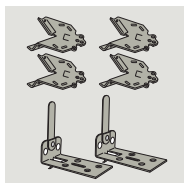
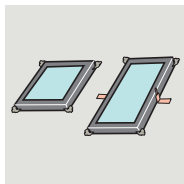


INSTALLATION BRACKETS

Installation brackets are supplied with the window or flashings for some specific installations.

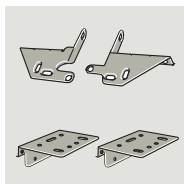
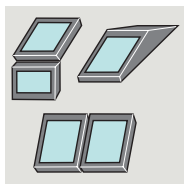
Window heights from -08 (1400 mm) and upwards are supplied with additional installation brackets to be fitted at the middle of the side frames.

The brackets must be fitted to the frame prior to positioning the window in the roof.



Some products and combinations require special brackets, eg:

- When the window is installed with recessed flashings EDN and EDJ, special brackets are supplied with the flashing.
- With some combinations of windows and flashings, special brackets are supplied either with the additional window elements, eg GIL, VFE, or with the flashing, eg EBW.



Installation of a roof window

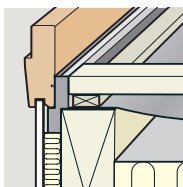
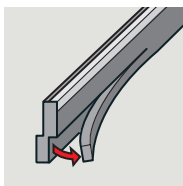
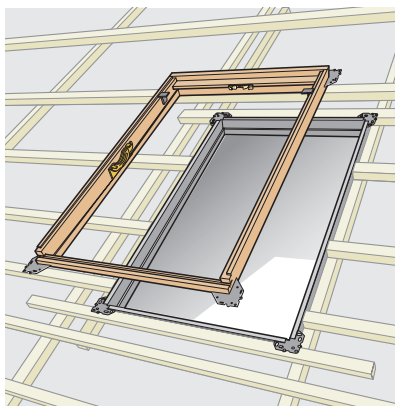
Exterior

2

FRAME INSULATION COLLAR

The frame insulation collar from installation set BDX 2000 consists of four long pieces of polyethylene foam fitted on steel rails. Assemble the rails as a frame then position on the battens around the roof opening before installing the window. It is then fixed along with the installation brackets of the window.

If the free distance between the rafters is not sufficient, it may be necessary to adjust the frame insulation collar to ensure correct positioning. Adjust by tearing along the slit on the sides.



The frame insulation collar allows for the installation of VELUX linings.

When using on-site linings the top and bottom parts of the frame insulation collar may need to be adjusted by tearing along the slit on the sides.

Installation of a roof window

Exterior

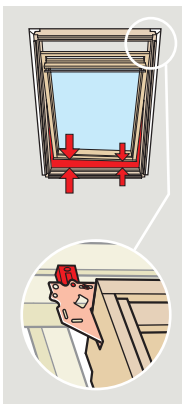
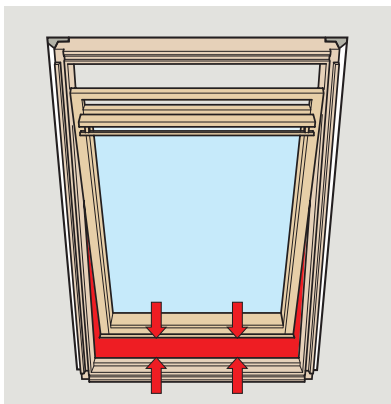
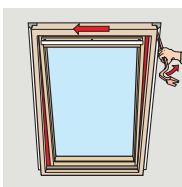
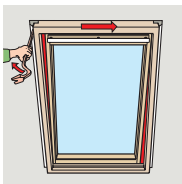
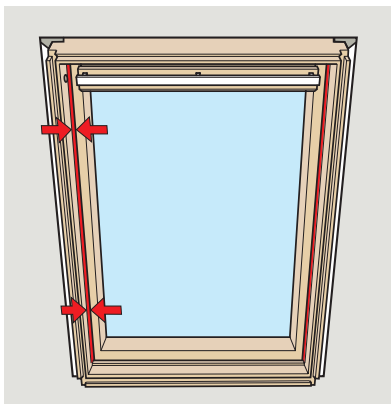
FIXING AND ADJUSTING THE WINDOW

It is important to adjust the square and level of the window to ensure a weathertight seal between the sash and frame and for optimum operation.

Start by fixing the bottom frame to the lower installation batten which should be level.

Adjust distance between frame and sash to ensure an even gap at each side. Bottom frame and bottom sash must be parallel. If uneven rafters cause the frame to twist, adjust frame using the wedge supplied as shown in the installation instructions. If the roof is not level, eg very lopsided/slanting, see pages 50-51.

Having adjusted the window, fix it as described in the installation instructions.



Installation of a roof window

Exterior

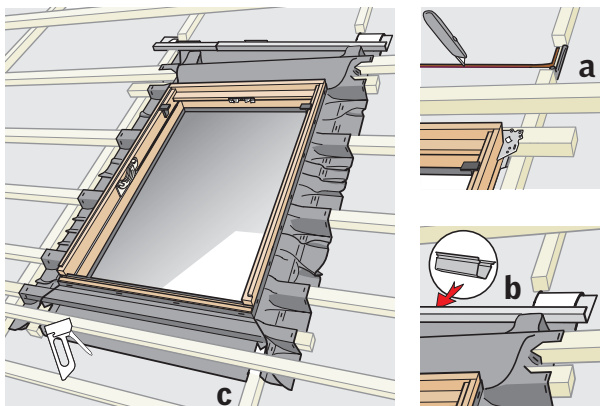
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UNDERFELT

For the easiest connection to underfelt, use underfelt collar BFX. The underfelt collar is made of diffusion open material and can therefore be used for both ventilated and unventilated roof constructions.

Fix the underfelt collar to the frame on all sides, shape it around the battens and fix it to the counter battens.

Position the drainage gutter immediately above the first continuous batten above the window so that it can drain off water from the underfelt above the window.



Fit self-adhesive butyl strips supplied as shown (a) to seal the felt where cut over the rafter.

Fold the underfelt collar and then the existing underfelt down into the drainage gutter and fix with brackets supplied (b).

To position and fix the underfelt collar correctly below the window, cut underfelt collar as shown (c).

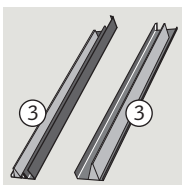
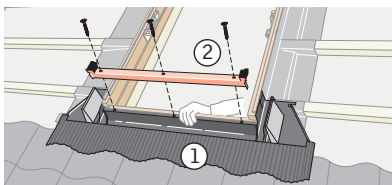
Installation of a roof window

Exterior

FLASHING AND COVERS

Fit flashing and covers in the sequence indicated in the installation instructions for the window and the flashing respectively. The individual parts have a number on the back that in most cases also indicates the installation sequence.

Note that there are left and right parts.

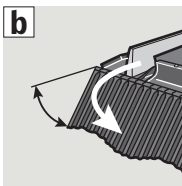
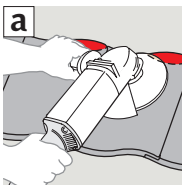
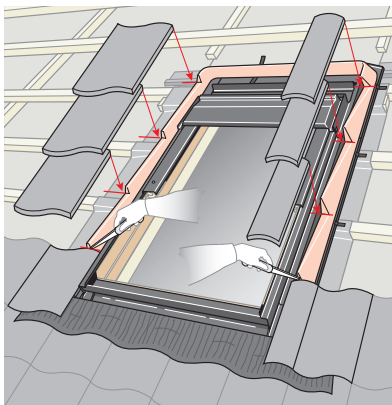


FLASHINGS FOR PROFILED ROOFING MATERIALS

When installing flashings for profiled roofing materials it is important that both foam gaskets and the flexible part of the bottom flashing section fit tight to the roofing material to avoid drizzle, driving snow etc entering under the flashing.

For installations using --W flashing variants it is recommended to chamfer the roofing material below the window before fitting the bottom flashing section (a).

Position the bottom flashing section temporarily and shape the flexible part to the profile of the roofing material. Remove the flashing and then bend the flexible part (b) slightly before re-positioning and fixing to the bottom frame of the window. Bending the flexible part ensures a tight connection to the roofing material.



Installation of a roof window

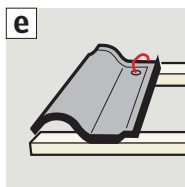
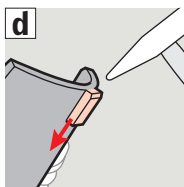
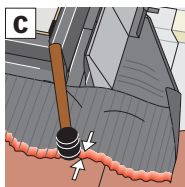
Exterior

2

Bend the bottom side flashing section at the sides (c). Especially in shallow roof pitches this is important as an extra guarantee against water ingress. The front edge of the flexible part of the bottom flashing section may be dressed further to fit tightly to the roofing material (d).

To allow for correct overlap between roofing material and flashing, it may be necessary to remove a nib from the tile (e).

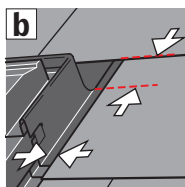
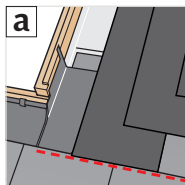
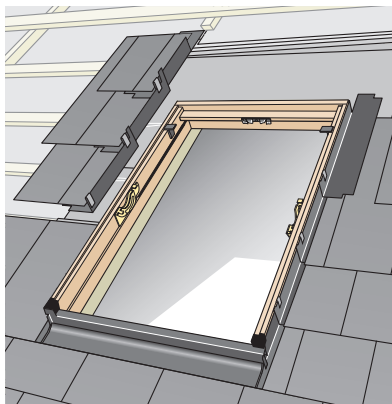
As you must not fit screws in the flashing, it may in some cases be necessary to secure tiles with wire and/or adhere to adjoining tile with appropriate sealant if possible (f).



FLASHINGS FOR FLAT ROOFING MATERIALS

When installing flashings in slated roofs or similar roofing materials, it is important that the bottom flashing section overlaps the roofing material with at least the same overlap as applies to the roofing material in general (a).

To provide the best possible drainage around the window, observe the distances between roofing material and window stated in the installation instructions (b).

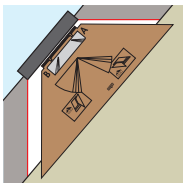


Installation of a roof window

Interior

CUTTING THE CEILING FINISH

When the window has been installed, adjust the hole in the ceiling finish to its final dimensions. If using a VELUX lining, adjust the hole by means of the template supplied with the lining that ensures horizontal lining at the top and vertical lining at the bottom. This principle also applies to on-site linings.

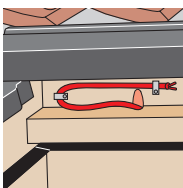
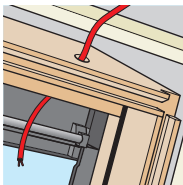


ELECTRICAL OPERATION

Before fitting the interior lining finish, it is recommended to fit a cable to prepare for subsequent installation of electrical products where necessary.

Run the cable through the pre-drilled hole in the top frame. Fasten approx 20 cm of the cable as shown. The rest of the cable can now be led hidden to a position suitable for subsequent connection to a control unit. For cables up to 40 m, use eg a cable with dimensions 2 x 1,5 mm² (see also page xx).

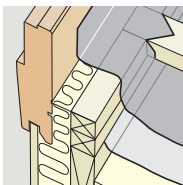
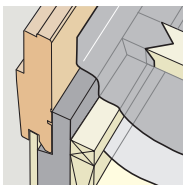
Note! Electrical operation of top-hung windows requires a different wiring procedure. Please contact VELUX.



INSULATION AROUND THE WINDOW

Correct insulation around the window is important to avoid thermal bridges. Installation set BDX ensures the necessary frame insulation. Use the wedge-shaped foam gaskets supplied to close possible gaps between frame and rafter.

If the installation set is not used, provide corresponding insulation around the frame up to the upper side of battens.



Installation of a roof window

Interior

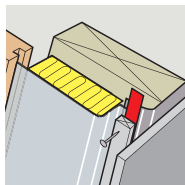
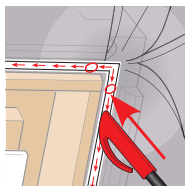
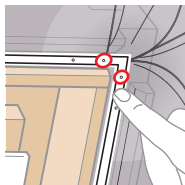
2

THE VAPOUR BARRIER

When a VELUX roof window is installed any vapour barrier present is penetrated. It must be re-established with a membrane that connects the window to the vapour barrier within the roof/wall construction.

VELUX vapour barrier collar BBX is the easiest solution.

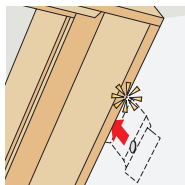
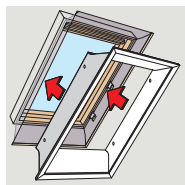
If the membrane used is not a VELUX vapour barrier collar BBX, this membrane must be connected to the window rebate at the frame with butyl or acrylic joint filler to ensure tightness. Where the window aperture meets the interior ceiling the membrane must be connected to the vapour barrier of the house by means of tape or tight overlapping joint.



THE LINING

When establishing the lining between the window frame and the interior ceiling finish, try if possible to make the lining horizontal at the top and vertical at the bottom. This gives the best warm air circulation across the inner pane surface, the best influx of light and the best view.

When using VELUX linings, the lining is assembled before being clicked into the rebate in one piece.



In general	28-29
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Integration – more windows

In general

Combining windows opens up many attractive solutions with VELUX windows.

In general, installation of additional windows does not differ and the same aspects should be considered and connection to the roof construction should be made as described for installation of one window, see chapter 2.

Note! The flashing is a very important element when combining windows together and in some cases the installation instructions supplied with the flashing also describes the installation of the windows.

Therefore, always start by reading all installation instructions before commencing work.

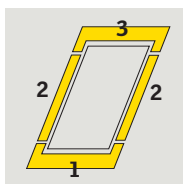


FLASHINGS

In general, a single flashing consists of a bottom flashing section (1), side sections (2) and a top flashing section (3).

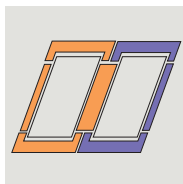
Basically, the same components are used when combining windows together. They are, however, supplemented with components that ensure drainage between the windows.

VELUX uses two drainage principles:



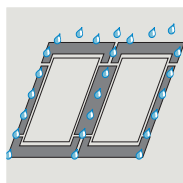
LOW-LYING MIDDLE GUTTERS

Flashings with low-lying middle gutters drain off the water from the roof surface above the window down both sides of each individual window and the centre channel between.



This principle makes it possible to combine an unlimited number of windows in the roof surface.

The principle is used for the combi flashing system.

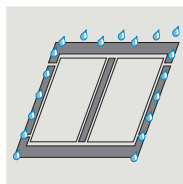
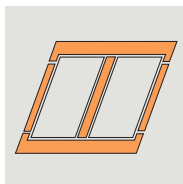


HIGH-LYING MIDDLE GUTTERS

Flashings with high-lying middle gutters drain off the water from the roof surface above the windows down the outer sides only of the window combination.

This principle makes it possible to install the windows closer to each other. This drainage principle is used eg for twin flashing EB-.

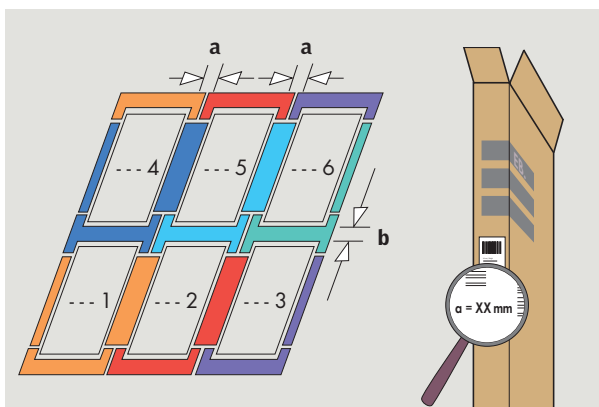
The total width of a combination with high-lying middle gutters must not, however, exceed 2780 mm.



Integration – more windows

Combi flashing EK-

The combi flashing system consists of seven basic elements that make it possible to install from two to any number of roof windows in combinations side by side or over/under each other. Windows to be installed side by side must be of the same height and windows to be installed over/under each other must be of the same width.



The seven basic elements have numbers referring to the last number in the variant code of the flashing. Thus, EKW M08 0002 is the middle flashing element in the bottom row.

Distance "a" refers to the distance between the side frames whereas distance "b" refers to the distance between top and bottom frames.

The distance "a" is as standard 100 mm, but combi flashings can be ordered as special products with "a" distances from 60 to 400 mm, with intervals of 10 mm. Distance "b" can only be 100 or 250 mm.

The distances must be stated when ordering the flashing. They will be included on the flashing carton for confirmation.

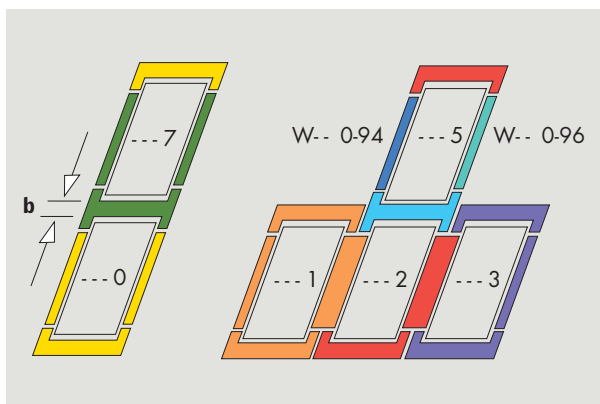
Note! If "a" is less than 100 mm, the windows must be installed with special brackets that are supplied with the flashing. Otherwise the standard brackets supplied with the window should be used.

To allow for subsequent installation of a roller shutter on the window, the distance "a" must be min 100 mm and "b" must be 250 mm.

As standard components, elements 1 and 3 are delivered together in one carton under the variant code 0021 since both parts are required irrespective of the numbers of windows being combined.

WINDOWS INSTALLED OVER/UNDER EACH OTHER

Combi element 7 is used when installing any number of windows over/under each other. Always use a single flashing for the bottom window supplemented with combi element 7.



ASYMMETRICAL INTEGRATION

By using asymmetrical flashing elements, windows can be installed in a combination with more windows in the bottom than in the top rows.

The asymmetrical flashing elements are used in the combi system as a kind of substitute for the missing windows. Eg flashing EK-W-- 0-94 is used instead of combi element 4.

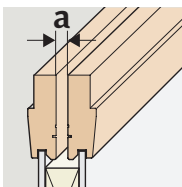
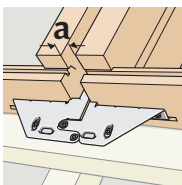
Combinations with less windows in the bottom rows are possible – in flat roofing materials with flashing EKL – and in profiled roofing materials with flashing EKW. These combinations must be ordered as special products; contact VELUX Company Ltd.

Integration – more windows

Twin flashing EB-

Twin flashing EB- is used when installing two windows of the same size side by side when a minimum frame gap is required.

As standard the two windows are installed with a frame distance "a" of 18 mm. Frame distances of between 19 and 95 mm, are possible, however, please contact VELUX for further information.



The high-lying middle gutter makes it possible to install the windows close together. A support timber must be provided between the windows.

If the distance "a" is 18 mm, it is advised that support rafter EBY be used.

Follow the instructions supplied with flashing EB- when installing the windows. Adjustment of the position of the window is described, however, in the installation instructions for the window.

Special brackets are supplied with the flashing.

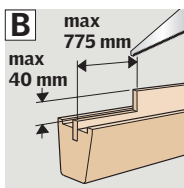
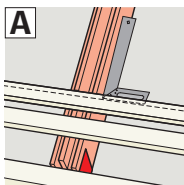
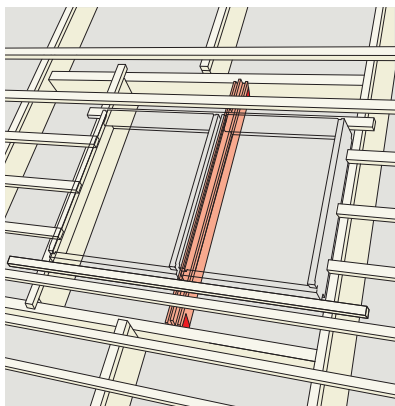
Installation of more than two windows side by side is possible, but please contact VELUX Company Ltd for further information.

Integration – more windows

Installation with support rafter EBY / EKY

Use support rafters EBY/EKY to obtain a harmonious room side finish when windows are installed side by side with a frame distance of 18 mm (EBY) or 100 mm (EKY). When using these support rafters, trimmers must be installed to support the construction, see chapter 4.

Support rafters EBY/EKY are available in three different lengths: 2000 mm, 2750 mm and 3500 mm.



Follow the installation instructions supplied with the support rafter when installing the windows. However, adjustment of the window is described in the installation instructions for the window.

When establishing the roof aperture and positioning trimmers and support rafter, it is important that the support rafter is positioned perpendicularly to the installation battens (A).

Observe the maximum dimensions stated when cutting the support rafter in order to avoid weakening it unnecessarily (B).

If installation set BDX is used, the frame insulation collar must be assembled and installed before the windows are installed.

EBY Only

The brackets used for connecting the windows are supplied with the flashing.

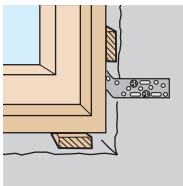
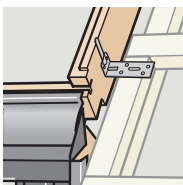
Connect underfelt as if connecting around one window. Position the drainage gutter immediately above the trimmer at the top to which the support rafter has been fitted. Then proceed according to the instructions supplied with flashing EB-.

Integration – more windows

Vertical window elements

VERTICAL WINDOW ELEMENTS VFE/VFA/VFB WITH FLASHINGS EFW/EFL

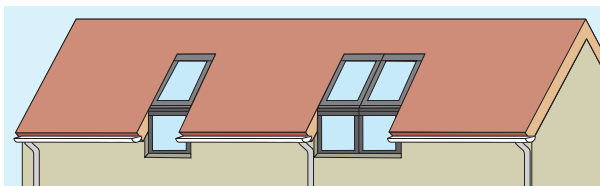
Vertical window elements VFE/VFA/VFB are always combined with a roof window of the same width. The flashings for these combinations are EFW/EFL.



Follow the instructions supplied with vertical window elements when installing the windows. However, adjustment of the roof window is described in the installation instructions supplied with the window.

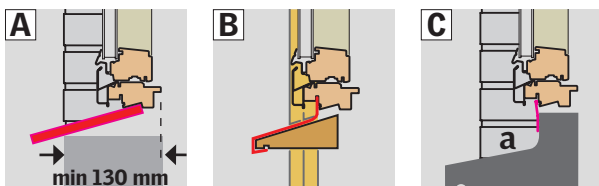
Special brackets for the roof window are supplied with the vertical window element.

Note! When installing roof windows in combinations with vertical window elements, the drainage of the roof must be considered, as the course of the eaves gutter is interrupted. As the flashing drains off the water to both sides of the windows, it must be ensured that there is a downpipe on both sides of the interrupted gutter.



POSITION IN FAÇADE

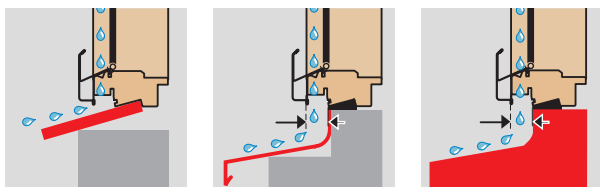
The roof window must be installed before the vertical window element. The template supplied with the vertical window element must be used for determining the exact position of the two windows. The optimum position of the vertical window element depends on the façade.



- A** Installation in brick, concrete wall etc: The vertical window elements VFE/VFA/VFB must be positioned at least 130 mm from the façade of the house. This ensures that the top cover of the window element lies behind the façade. It also makes installation of an outer sill easier.
- B** Installation in façade with vertical wooden boarding (with overlap): The vertical window elements VFE/VFA/VFB must be positioned so that the outer edge of the side frames is flush with the innermost layer of boarding.
- C** In some cases, it may be necessary to cover the joint between the bottom frame and the outer sill. For this purpose an additional cover part can be ordered as special product (a).

OUTER SILL AND DRAINAGE OF BOTTOM FRAME

The outer sill can be made in many ways depending on the façade. It is important that there is a sufficient overlap between the bottom frame and the outer sill (approx 25 mm) to ensure that water from the gasket level of the window can be drained off.

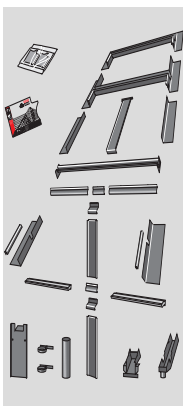


Integration – more windows

Vertical window elements

ADDITIONAL VERTICAL WINDOW ELEMENTS VFE/VFA/VFB WITH FLASHINGS EFW/EFL X99

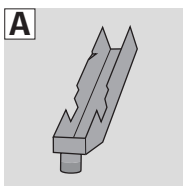
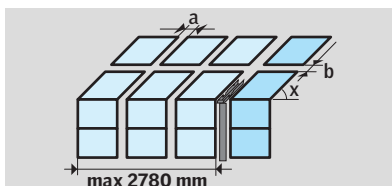
Using flashings EFW/EFL X99, vertical window elements VFE/VFA/VFB can be combined with any number of windows in the roof and in the façade.



The flashing must be ordered as a special product with exact specification of the position of the individual windows. To ensure sufficient drainage of the roof surface above the windows, there are some limitations as to possible combinations.

A combination of windows with a total width of less than 2780 mm will, as a single window, drain off the water to both sides of the combination.

Combinations with a total width of more than 2780 mm require drainage between the windows. This is established by inserting a low-lying middle gutter and "box" gutter (A) that drains off water separately to a downpipe.

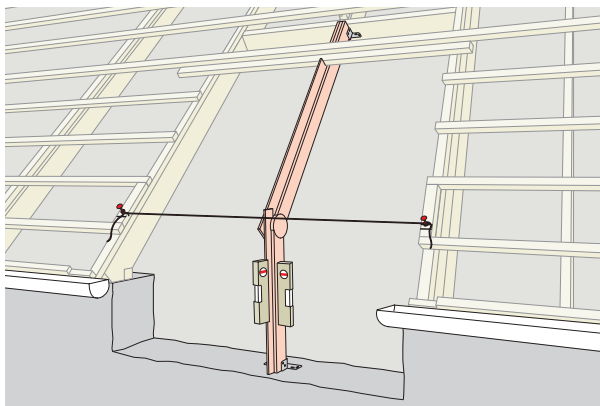


Integration – more windows

Installation with adjustable support rafter EBY W10

Adjustable support rafter EBY W10 is recommended for combinations including vertical window elements installed with a frame distance 18 mm.

Adjustable support rafter EBY W10 can be used in roof pitches from 15° tot 55°.



When using this adjustable support rafter, a trimmer spanning the total width of the aperture is installed in the roof construction. The adjustable support rafter takes over the support of the windows while at the same time ensuring an elegant room side finish.

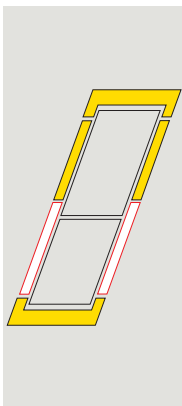
In combinations with additional adjustable support rafters the total width of all windows must not exceed 2780 mm because of the flashing.

Integration – more windows

Additional elements below roof window

ADDITIONAL ELEMENTS GIL/GIU AND FLASHING EXTENSIONS ETW/ETL

Additional elements GIL/GIU are installed immediately below the roof window.



The flashing for this combination is a standard ED- single flashing together with flashing extensions ETW/ETL.

Follow the instructions supplied with additional elements GIL/GIU when installing the windows. However, adjustment of the roof window is described in the installation instructions for this window.

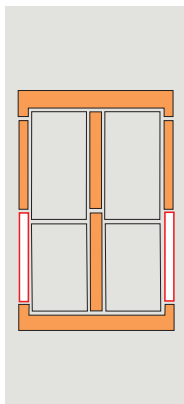
The additional element is supplied with special brackets.

Note that the frames of the roof window and the additional element must be flush to allow for subsequent fitting of linings.

ADDITIONAL ELEMENTS GIL/GIU IN TWIN INSTALLATION

Two roof windows each with additional elements GIL/GIU can be installed with a frame distance of 18 mm using support rafter EBY and a variant of twin flashing EB-.

Twin flashing EB- must be ordered as a special product.



Follow these guidelines during installation:

1. Prepare hole and install necessary trimmers.
Width: $X \text{ mm} + 18 \text{ mm} + X \text{ mm} + 50 \text{ mm}$.
Height: $Y \text{ mm} + 920 \text{ mm} + 45 \text{ mm}$.
 $X \text{ mm}$ = window width, Y = window height
2. Install support rafter EBY according to instructions supplied with EBY.
3. Install frame insulation collar from installation set BDX 2000 with extension pieces BDX W34 according to instructions supplied.
4. Install and adjust windows.
5. Connect windows to underfelt with underfelt collar BFX and position drainage gutter immediately above upper trimmer to which the support rafter is fixed.
6. Install flashing and fit covers according to instructions supplied with additional elements GIL/GIU and the flashing.

It is also possible to integrate three windows side by side provided that the total width of the window combination with high-lying middle gutters does not exceed 2780 mm.

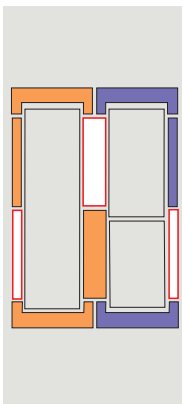
Integration – more windows

Additional elements below roof window

ADDITIONAL ELEMENTS GIL/GIU IN COMBI INSTALLATION

Roof windows with additional elements GIL/GIU can also be used in combi installations with flashing extensions ETW/ETL and ETX as supplement to the common combi flashing elements.

For example; if a Roof Balcony CABRIO® GDL is to be included in a combi installation, additional element GIL must be installed beside the balcony with a roof window (height -10) above. The total length/height of these two windows corresponds to that of the balcony.

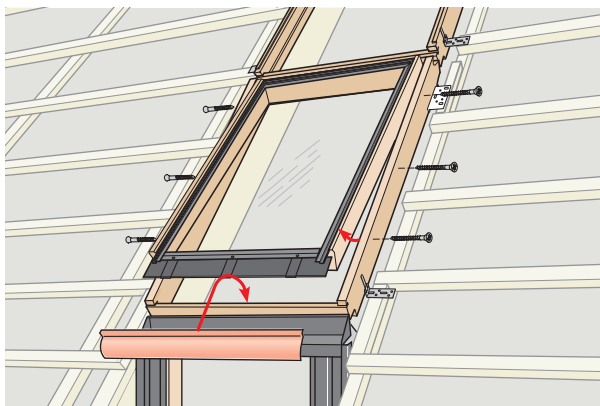


ADDITIONAL ELEMENT GIL ABOVE VERTICAL WINDOW ELEMENT VFE

Vertical window element VFE can be installed below a combination of a roof window with additional window element GIL.

For this purpose, use flashings EFW/EFL together with flashing extensions ETW/ETL.

As the sash of additional element GIL cannot be opened, it is necessary to remove it in order to fit covers between GIL and the vertical window element.



Follow these guidelines during installation:

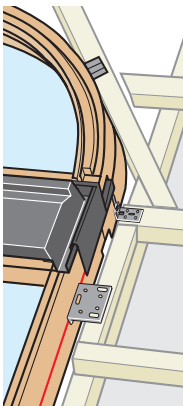
1. As the sash of the additional element GIL is secured with screws, the screws must be loosened. Depending on the roof pitch, it may be necessary to remove the sash.
2. Fit covers between the additional element and the vertical window element.
3. Having fitted the covers, refit sash.

Integration – more windows

Additional elements above roof window

ADDITIONAL ELEMENTS GIR/GID/GIV

Additional elements GIR/GID/GIV can be installed immediately above a roof window.

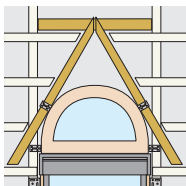


The flashing for this combination is a standard ED- flashing without top flashing section and a variant of combi element 7 with the relevant shape.

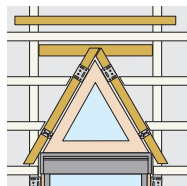
Roof windows with additional elements GIR/GID/GIV can be used in combi installations with low-lying middle gutters. They may, however, only be installed side by side.

Note that these windows cannot be used in installations with high-lying middle gutters.

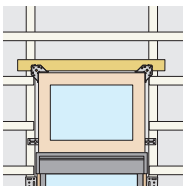
GIR



GID



GIV

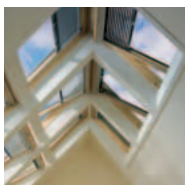


Integration – more windows

Installation along roof ridge

3

Installing windows along the roof ridge opens up to spectacular combinations of VELUX roof windows – seen from the inside as well as from the outside.



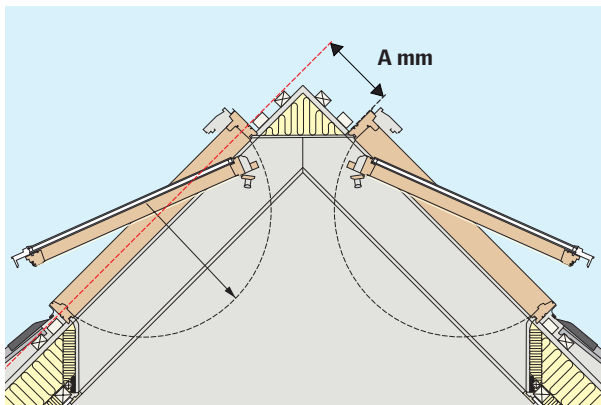
The procedure is simple:

The installation itself does not differ much from a standard installation and the same rules as to positioning the window in relation to the roofing material must be observed.

Therefore, in tiled roofs always try to allow for a full course of tiles below the windows.

When installing windows along the roof ridge, it is important to know the "ridge measurement". This is the distance from the top frame of the window to upper side of battens (red line) on the opposite roof surface. In the following this measurement is defined as "A" mm.

Decide window size on the basis of this measurement.



Integration – more windows

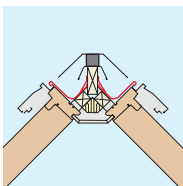
Installation along roof ridge

When choosing flashing for installations along roof ridge, the simplest solution is to use standard flashings (EDW, EDL, EDS) on each side of the roof combined with a roof ridge kit (EKW --0 --88) to ensure a watertight and harmonious integration over the ridge. In case of more windows installed side by side, standard combi flashings (EKW, EKL, EKS) are used in combination with one roof ridge kit for each pair of windows over ridge.

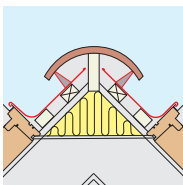
Whether it is single windows or windows in combination, the top flashing sections must be adjusted depending on the distance "A".

The distance "A" must be 80-200 mm and the roof pitch 15°-55°.

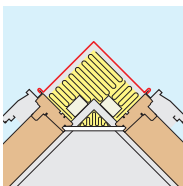
Note! Roof ridge kit (EKW --0 --88) requires a ridge board to support the roof ridge (especially in slate roofs).



If distance "A" is 200 mm or more, the standard flashing can be used without any adjustment. There is enough space for the top flashing sections and the ridge tiles can continue uninterrupted.



To make it possible to install the windows closer to each other, use VELUX over ridge flashing. This flashing connects two windows of the same width across the ridge and makes it possible to position the top frames of the windows close to the ridge.



Integration – more windows

Installation along roof ridge

The over ridge flashing is used with standard single or combi flashings and replaces the top flashing sections of these flashings. Note that the over ridge flashing can only be used in roof pitches from 20° tot 50°.

As the over ridge flashing is made to measure for the individual situation, it must be ordered as a special product. The order must include a drawing/draft with the following information:

- roof pitch of each roof surface
- flashing variant (material)
- window sizes
- distance "A" measured at red-line-level
- if more windows are installed side by side, state frame distance "a"

When the windows are installed with the top frames close to the ridge, note that the windows must be positioned in a way that allows them to be opened without the sashes colliding.

When using centre-pivot windows, this can be ensured by observing the following distances ("A" mm):

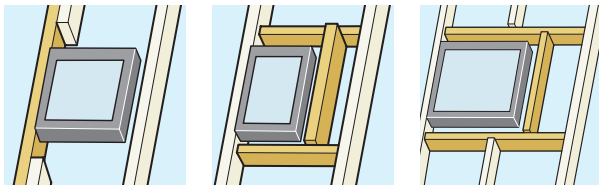
Roof pitch	Window height				
	780 mm	980 mm	1180 mm	1400 mm	1600 mm
20°	1)	1)	1)	1)	1)
25°	1)	1)	1)	40 mm	50 mm
30°	40 mm	40 mm	40 mm	80 mm	100 mm
35°	50 mm	70 mm	90 mm	120 mm	140 mm
40°	90 mm	110 mm	140 mm	170 mm	2)
45°	120 mm	160 mm	2)	2)	2)
up to 50°	2)	2)	2)	2)	2)

- 1) The windows can be installed frame-to-frame without risk of colliding sashes.
- 2) VELUX over ridge flashing can only be ordered for installations with distance "A" not exceeding 170 mm.

Trimmers	48-49
Installation in lopsided roof	50-51
Connection to hard underroof	52-53
Half tiles below the window	54
Roof windows installed as dormer	55
Window installed as skylight	56-57
Mansard roof	58
Installation in connection with vertical wall	59
Flat roof	60-61
Atrium in flat roof	62-63

Special installation conditions

Trimmers



If the window is wider than the distance between the rafters, it may be necessary to install trimmers in the rafter construction. In most cases when installing a trimmer to support a single rafter, the solution is based on experience. Most often the trimmer has the same dimensions as the rafters.

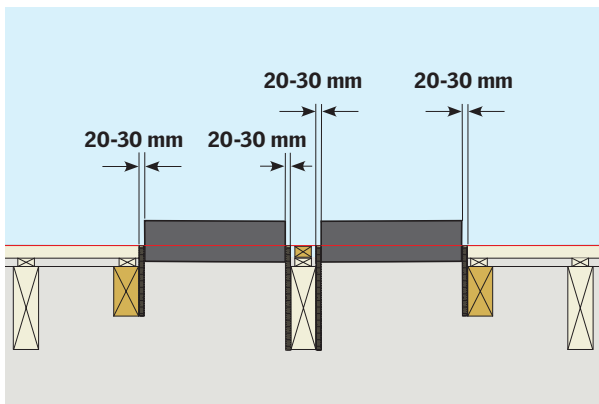
Note! Some constructions may require static calculations of the load capacity of the new trimmer and remaining rafters.

Special conditions to consider:

- A large roof surface above or below the trimmer
- Existing trimmers in the roof construction close to trimmer
- Possible special support conditions of remaining rafters

For combinations of more windows side by side, it is often possible to adjust window width and frame distances between the windows in order to retain rafters. This must be determined before ordering flashings.

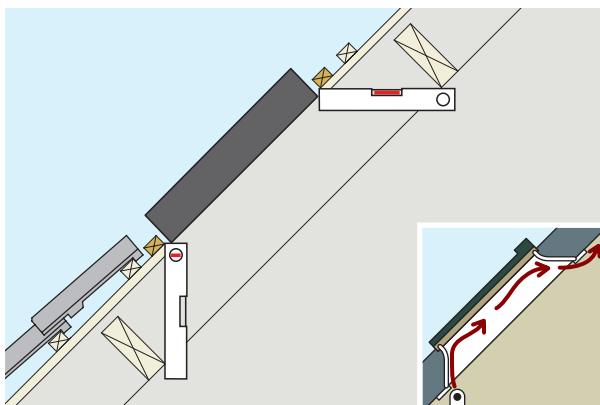
Recommended distances to rafters to allow for effective insulation around the windows.



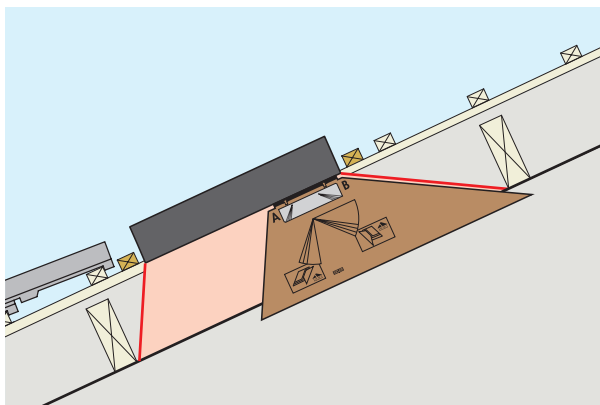
Special installation conditions

Trimmers

4



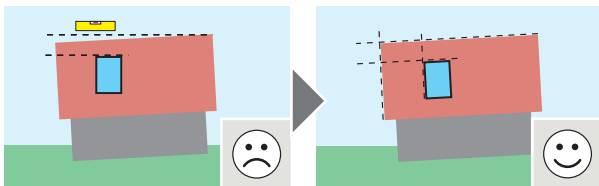
Good air circulation across the inner pane surface minimises the risk of condensation. Circulation is achieved by a horizontal top lining and vertical bottom lining to form a "funnel" leading air across the pane. If trimmers are necessary, they must be positioned in such a way that they do not obstruct the angled lining. When using VELUX linings in roof pitches from 30° to 60° , trimmers must be positioned outside horizontal (top) and vertical (bottom) level measured from window frame as shown in illustration above to allow for correct installation of lining. In roof pitches shallower than 30° or steeper than 60° , the VELUX lining cannot be installed with both horizontal top and vertical bottom as this will result in removing too much of the interior ceiling finish. Instead, the cardboard template supplied with the lining is used for determining the right position of the trimmer.



Special installation conditions

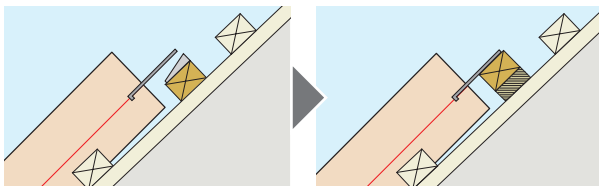
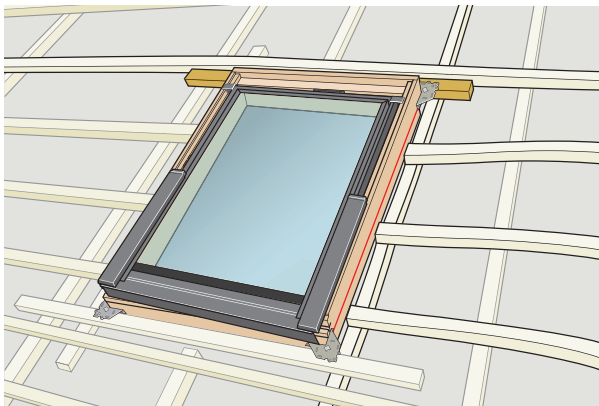
Installation in lopsided roof

In old buildings with very lopsided roof constructions it may be necessary to deviate from the standard procedure for adjusting the window. The window should still be installed as normally but consideration could be given to alignment with existing floor level and roof.



Major local lopsidedness in the roof construction may also complicate adjustment of the window.

It may be necessary to elevate one corner of the window with more than the height of the wedge supplied. In this case the entire installation batten must be elevated.



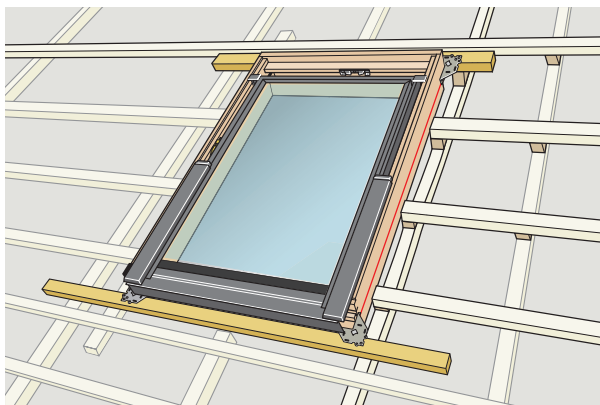
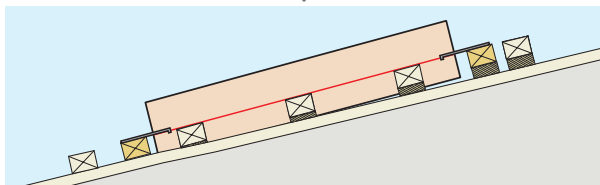
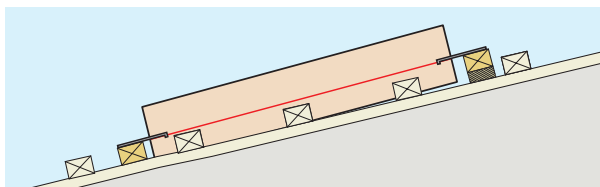
Special installation conditions

Installation in lopsided roof

4

In this case the red-line-level of the window will lie above the upper side of the battens resulting in a risk of leakage in the flashing if this aspect is not taken into account.

Therefore, to even out the connection between the flashing and the roofing material, it is necessary to "chock up" the battens around the window.



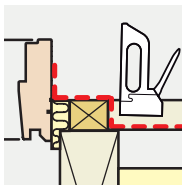
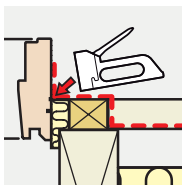
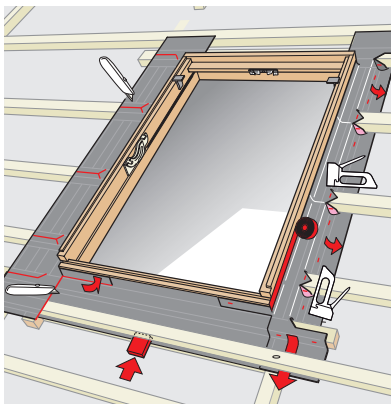
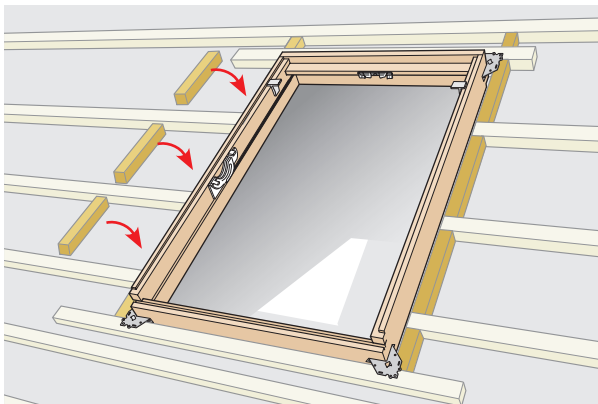
Special installation conditions

Connection to hard underroof

UNDERROOF OF MASONITE PLATES

Connection to underroof of masonite plates can be made either with VELUX underfelt collar BFX or with standard underfelt in rolls.

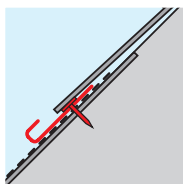
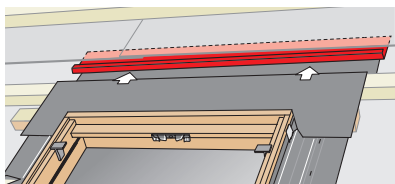
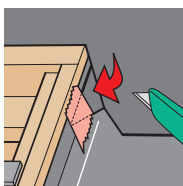
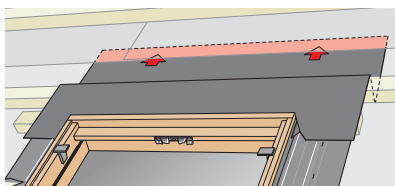
Note! If no counter battens have been used in connection with the masonite underroof, it may be necessary to make a "frame" around the window to which the underfelt or the underfelt collar can be fixed. The "frame" can be made by placing infill battens between battens along the sides of the window. Subsequently, the underfelt or the underfelt collar can be connected below and along the sides of the window as shown.



Special installation conditions

Connection to hard underroof

4

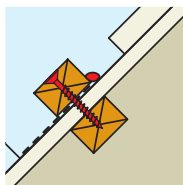
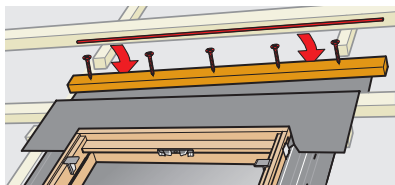
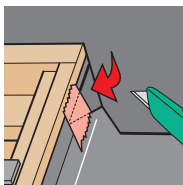
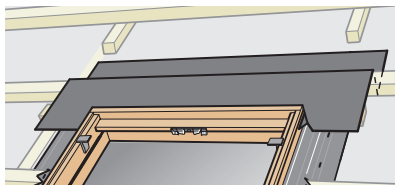


Place underfelt/underfelt collar and drainage gutter above the window so that they are overlapped by the nearest roofing plate above the window.

UNDERFELT ON HARD BASE

Connection to underfelt on hard base – boards or sarking – can be carried out with VELUX underfelt collar BFX as well as standard underfelt in rolls.

Note! As in some cases an uninterrupted underfelt is required, ensure sufficient drainage by fitting slat with screws and joint filler as shown. This also ensures connection to the underfelt (in rolls) or the underfelt collar BFX above the window.



Special installation conditions

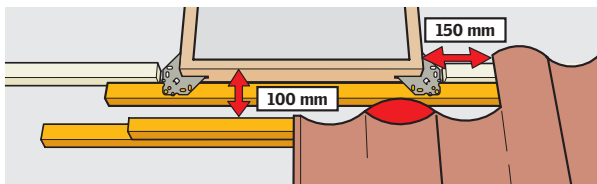
Half tiles below the window

Always try to allow for a full course of tiles below the window. If conditions on site make this impossible, try the following options:

Cut tiles below the bottom frame of the window. Ensure support of the end that has been cut as shown. It may be necessary to chamfer the tiles as shown in the installation instructions.

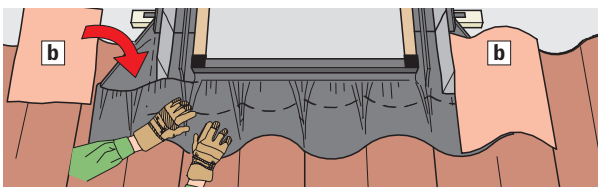
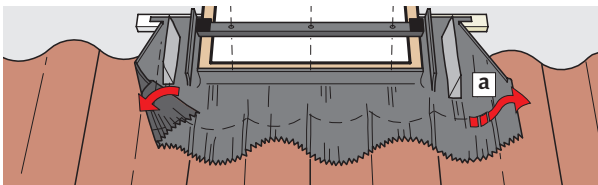
As the nibs have been removed from the tiles below the window, the tiles must be secured to the battens with screws or nails.

Observe distances shown in the illustration.



When positioning the bottom flashing section it may also be necessary to shape the triangular part **(a)** to the same profile as the tiles.

Often, it will be necessary to use additional self-adhesive flashing material **(b)** (not supplied by VELUX) to seal between bottom flashing section and tiles in the corners.



Special installation conditions

Roof windows installed as dormer

4



VELUX roof windows and vertical window elements can be used as an alternative version of a traditional dormer, providing more daylight and ventilation.

This solution consists of the following VELUX products in clear laquer or white painted finish;

- timber roof windows GGL/GHL/GPL
- timber vertical window elements VFE/VFA/VFB
- adjustable support rafter EBY W10

in combination with flashing system for slate or tiled roofs in double or triple combination.

The VELUX dormer YWY is available in double or triple sets for roof pitches 42°-52°.

For further information please contact VELUX Company Ltd.

Special installation conditions

Window installed as skylight

When installing VELUX roof windows as skylights, ie out of reach, consider choosing electrically operated roof windows GGL INTEGRA®/GGU INTEGRA® or GGL Solar/GGU Solar.

Alternatively, it is recommended to lead a cable to the window, see page XX. This makes retrofitting of electrical accessories such as window operators and electrically operated decoration and sunscreening possible.

The installation of the roof window follows standard installation procedures.



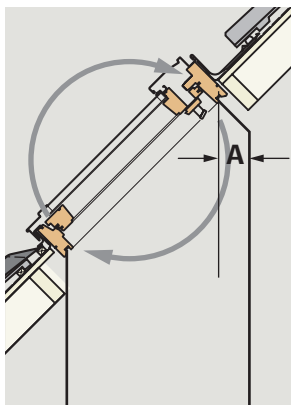
INSTALLATION IN LIGHT SHAFT

In buildings with unused attics, VELUX roof windows can be installed as skylights by establishing a light shaft.

Ensure all trimming work is carried out to structural requirements where necessary.

Observe the following:

- The light shaft must allow the window to be rotated 180 degrees to cleaning position, see illustration below.

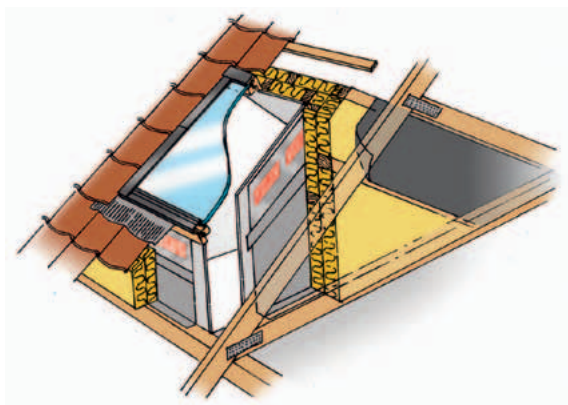


Roof pitch	Window size Size/cm					
	X02 78	X04 98	X06 118	X08 140	X10 160	X12 180
15°	0	0	0	0	0	0
20°	0	0	0	0	0	0
25°	0	0	0	0	2	3
30°	0	0	0	2	3	5
35°	0	0	2	3	5	7
40°	0	0	3	5	7	11
45°	0	2	5	7	11	15
50°	0	3	7	11	15	19
55°	2	5	11	15	19	24
60°	3	7	15	19	24	30
65°	5	9	19	24	30	36

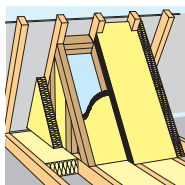
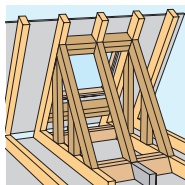
Special installation conditions

Roof window installed as skylight

4



- Provide vapour barrier to shaft. Connect to roof window rebate and existing ceiling vapour barrier if present.
- Insulate the shaft and depending on the insulating material establish a wind barrier on the exterior of the shaft.
- As the windows are installed out of reach, white finish polyurethane windows GGU requiring a minimal amount of maintenance are ideal.



When determining position of the light shaft, consider supported walking areas, ventilation channels, chimneys and antennas/aerials within the roof space/construction.

Ensure all trimming work is carried out to structural requirements where necessary.

Special installation conditions

Mansard roof

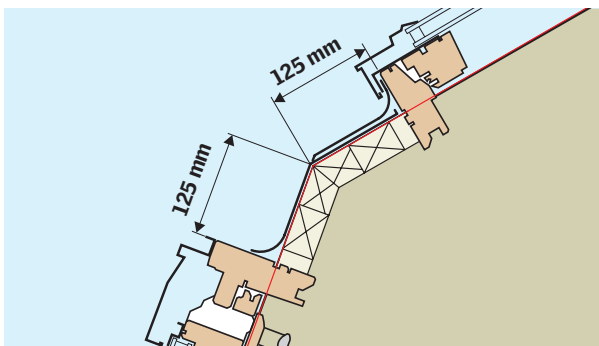
Installation in a mansard roof does not differ much from a standard installation. Several types of roof windows can be installed in vertical position without problems.



The mansard roof offers the opportunity of spectacular installations, eg two windows can be installed on either side of the "break point".

Special flashing components that make this possible are available from VELUX. The distances indicated must be observed.

When contacting VELUX, state roofing material and roof pitches of both roof surfaces.



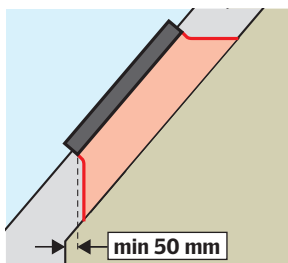
Special installation conditions

Installation in connection with vertical wall

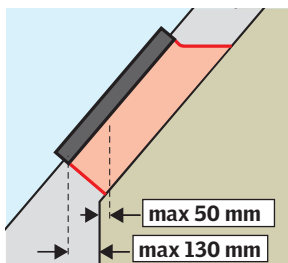
4

There are special aspects to be considered when installing a window with lining in connection with a vertical wall. If using VELUX linings, these guidelines may be followed:

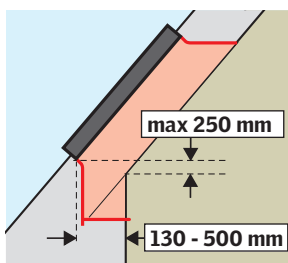
If the distance (measured horizontally) from the vertical wall to the interior edge of the bottom frame is more than 50 mm, use a VELUX standard lining or alternatively an on-site lining.



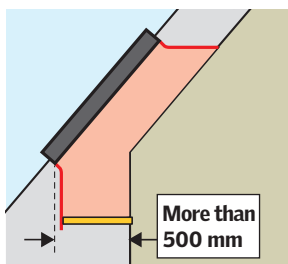
If the bottom frame lies within the distances shown to the vertical wall, use a VELUX standard lining installed with bottom element perpendicular to bottom frame or alternatively an on-site lining.



If the bottom frame lies within the distances shown from the angle of the wall, use a VELUX standard lining together with a VELUX vertical wall element LEI or alternatively an on-site lining and sill.



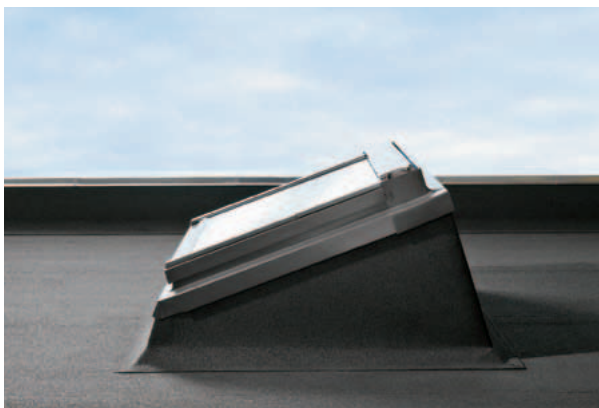
If the bottom frame is positioned as shown, a VELUX standard lining can be used together with a special made-to-measure VELUX vertical wall element LEI with a sill depth of max 750 mm or alternatively an on-site lining and sill.



Special installation conditions

Flat roof

Use VELUX Flat Roof Kerb ECX for installation of VELUX roof windows in flat roofs. The Flat Roof Kerb can be used in roofs with a pitch of between 0° and 15° and allows you the flexibility to select the most appropriate type of roof window for the application.



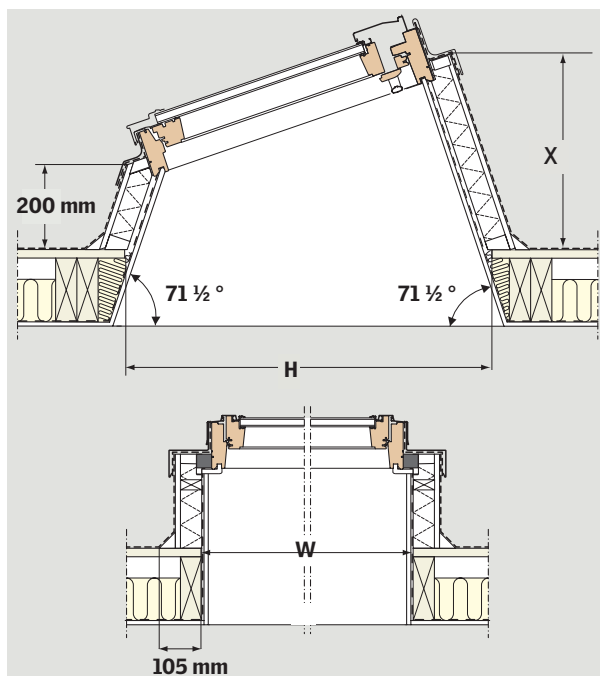
The kerb is made of insulated plywood and is normally flashed externally with the same material as the roof covering. This is then overlapped by the flashing components provided with the system. An on-site lining is used to finish the kerb internally.


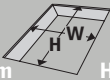
Special installation conditions

Flat roof

4

The Flat Roof Kerb comes in ten standard sizes. Typical opening sizes required in the roof are shown below.



			
	W mm	H mm	X mm
ECX C02	600	940	479
ECX C04	600	1150	543
ECX F06	700	1360	606
ECX M04	800	1150	543
ECX M06	800	1360	606
ECX M08	800	1590	676
ECX P10	1000	1810	740
ECX S06	1200	1360	606
ECX U04	1400	1150	543
ECX U08	1400	1590	676

Special installation conditions

Atrium in flat roof

ATRIUM

It is possible to install VELUX roof windows in flat roofs (roof pitches from 0° to 15°) to produce an atrium type effect. However, this installation requires special cover and flashing components that must be ordered as special products.



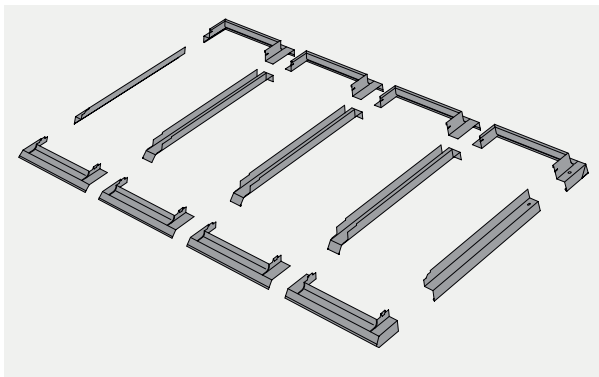
Cover and flashing components are based on a kerb construction similar to VELUX Flat Roof Kerb ECX.

The kerb for the atrium is not part of the VELUX product programme and should be made on site. Certain dimensions must be respected, see drawings opposite.

The dimensions of the kerb vary depending on chosen window sizes and frame distance.

Before installing the windows, ensure that the construction is structurally stable.

Install the windows according to the installation instructions for the window. Supplementary instructions are enclosed with the special flashing.



Special installation conditions

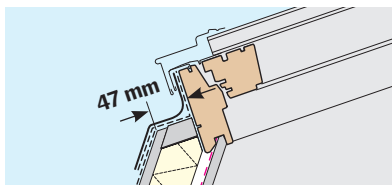
Atrium in flat roof

4

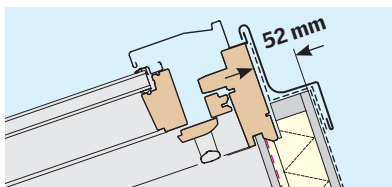
Various options are available as to the combination of window sizes and frame distances. It is advised to contact VELUX Company Ltd in the first instance to discuss the specific requirements.

Note! The pitch of the window in the kerb must always be 20°.

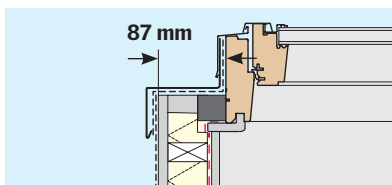
Section, bottom



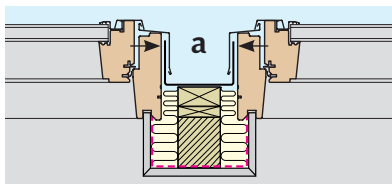
Section, top



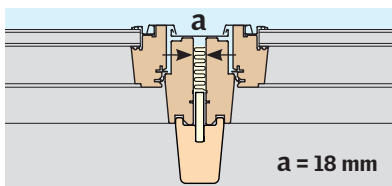
Section, side frame



Section between windows



Section between windows of installation with VELUX support rafter EBY. The solution can be used when the total length of the light band does not exceed 2780 mm.



Roofing felt	66-67
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Grass roofs and the like	80-81

Special roofing materials

Roofing felt

Use flashing EDL/EBL/EKL for installation of VELUX roof windows in roofs with roofing felt and a roof pitch steeper than 15°. The flashing must be positioned between the roofing felt layers with correct overlaps which means that the order below must be observed.

IN NEW ROOF

After having finished the boarding or sarking, and establishing window aperture in roof, install the window.

- 1 Position bottom layer of roofing felt on the roof surface around the window. Ensure that the roofing felt covers approx 50 mm of the frame on all sides.

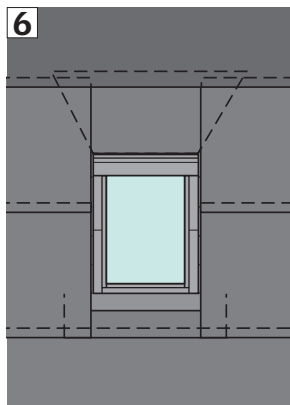
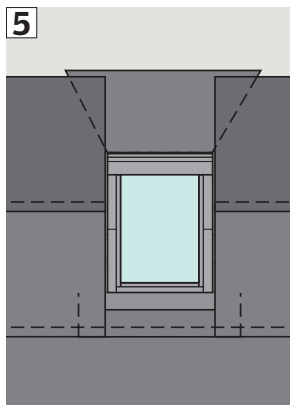
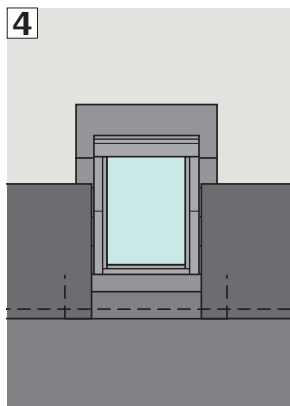
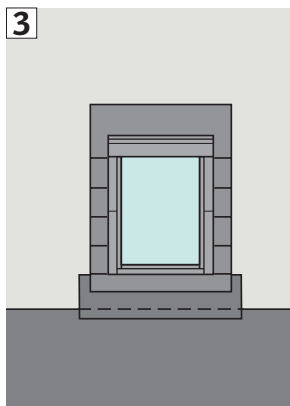
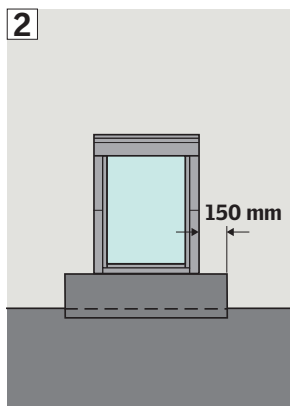
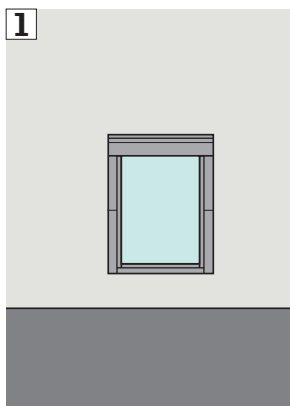
Note: Use a cold adhesive instead of naked flames that might damage the window and the frame insulation collar from installation set BDx, if any.

- 2 Position top layer of roofing felt below the window – butt the roofing felt to the bottom frame.
- 3 Fit flashing EDL. Distribute side soakers evenly along the sides of the window.
- 4-5-6 Position top layer of roofing felt at top and sides of the window.

IN EXISTING ROOF

Installation in existing roof follows the same principle as in new roof with a few exceptions.

- Cut hole in existing roofing felt where the window is to be installed (see installation instructions) and install the window.
- Position four strips of roofing felt and lead it approx 50 mm up the frame all the way round.
- Fit flashing EDL.
- Position top layer of roofing felt along sides and above window. It is recommended to continue the roofing felt to the ridge to avoid horizontal edges in the roofing felt.

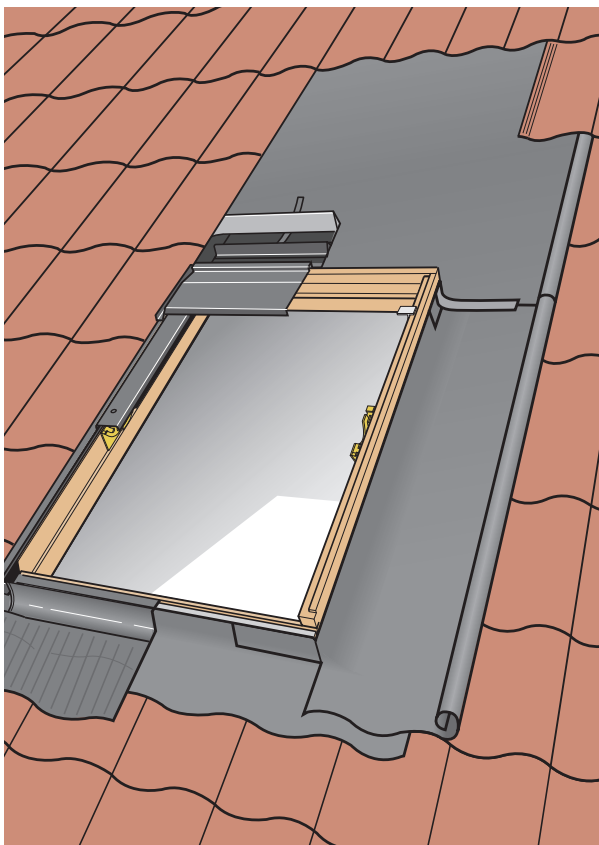


Special roofing materials

Unfelted roofs

When installing roof windows in older roofs where roofing felt may not be present it is still advisable to use an underfelt collar such as VELUX underfelt collar BFX around the window. Alternatively, use underfelt material in rolls.

The underfelt collar must end under the bottom flashing section. Lead the collar to the second row of tiles at the sides of the window and roll it to form a "sausage" that ensures a tight connection under the top of the tiles as shown. Fix the collar to the window with butyl strip and staples. Tape overlap with a suitable tape.



Special roofing materials

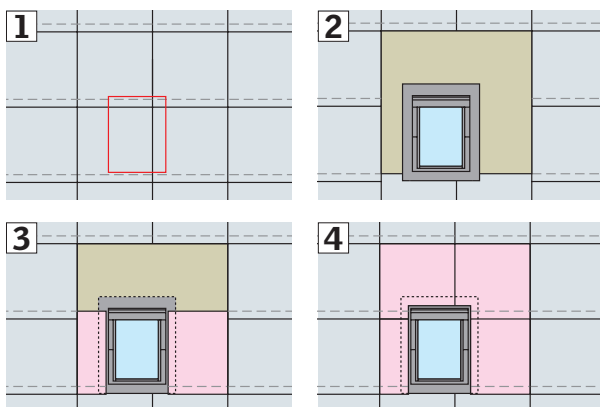
Principle for adjustment of roofing sheets

5

Use flashing EDW for installation of VELUX roof windows in roofs with profiled roofing sheets, eg Eternit sheeting.

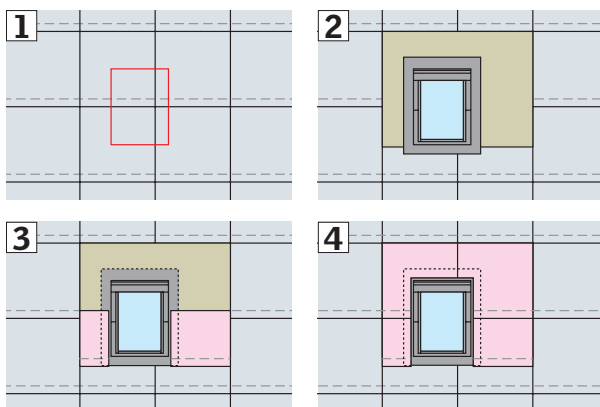
Adjustment when a whole roofing sheet below the window is possible:

Position flashing around the window (ill. 2). For information about installation battens and distances to the roofing material and other elements in the roof construction, see installation instructions for roof window and flashing respectively.



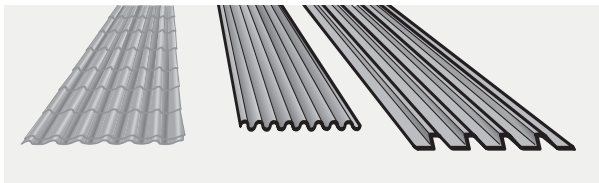
Adjustment when a whole roofing sheet below the window is not possible:

Cut the sheets 100 mm below the window. Then finish installation as shown below. Position flashing around the window (ill. 2).

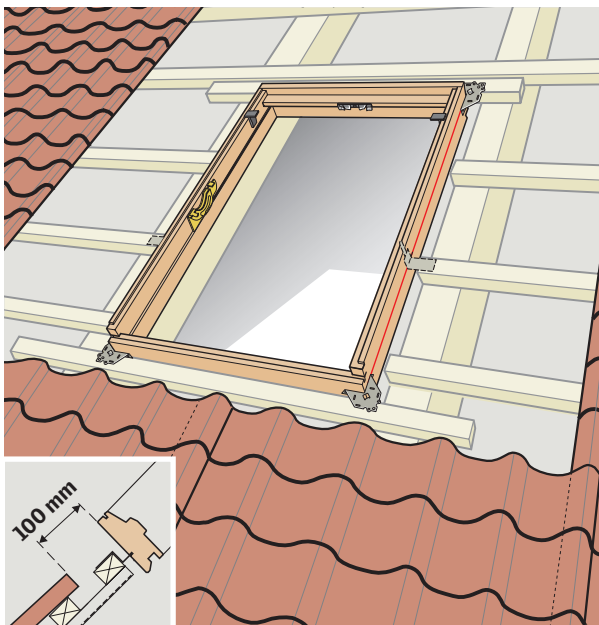


Special roofing materials

Profiled metal sheets



Use flashing EDW for installation of VELUX roof windows in roofs with profiled single skin metal sheets that are uninterrupted from eaves to ridge of roof.



Cut roofing sheets 100 mm below the bottom frame. Install window on installation battens observing distances as shown in the installation instructions for the window.

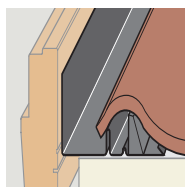
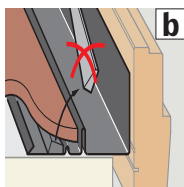
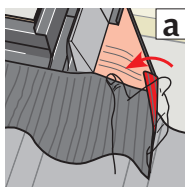
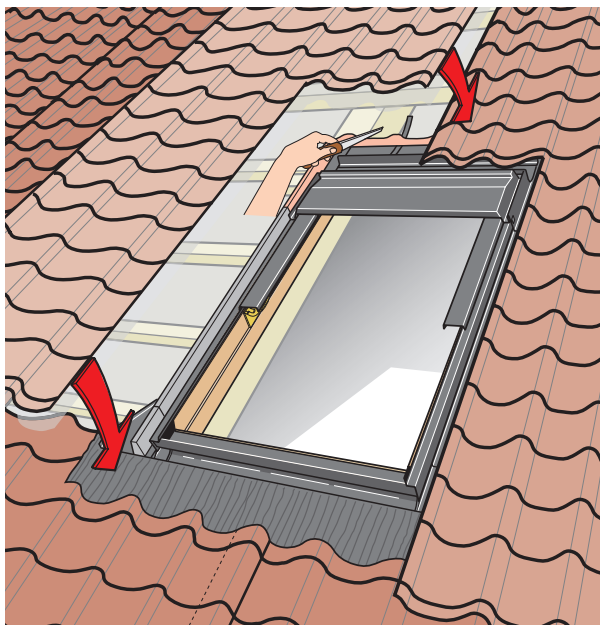
Special roofing materials

Profiled metal sheets

5

Install the flashing around the window and shape the bottom flashing section as shown in the installation instructions for the flashing (a).

Position roofing sheets uninterrupted from the bottom frame to the roof ridge along the sides and above the window. Observe distances from roofing material to window frame as shown in the installation instructions for the window and adjust the foam gaskets of the flashing (b).

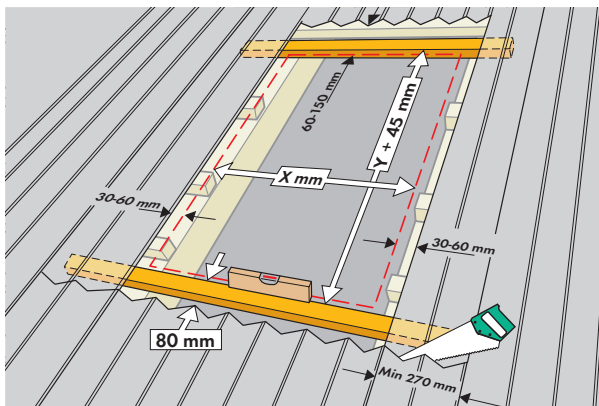


Special roofing materials

Profiled metal sheets

If removing roofing sheets as shown on the previous pages is not possible, use the following method.

Establish hole for window as shown.

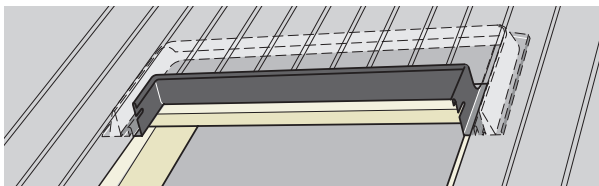


Cut the metal sheets. The distance from the installation batten to the metal sheet roof **must be 80 mm**. Extend the cut at least 270 mm on both sides of the window to make room for the entire bottom flashing section.

Note that the end of the cut must finish on the highest level of the roofing sheets.

The distance from the side frames to the metal sheet roof must be 30-60 mm. The distance from the top frame to the metal sheet roof must be 60-150 mm.

Position the top flashing section under the metal sheets before installing the window frame. Adjust foam gasket.

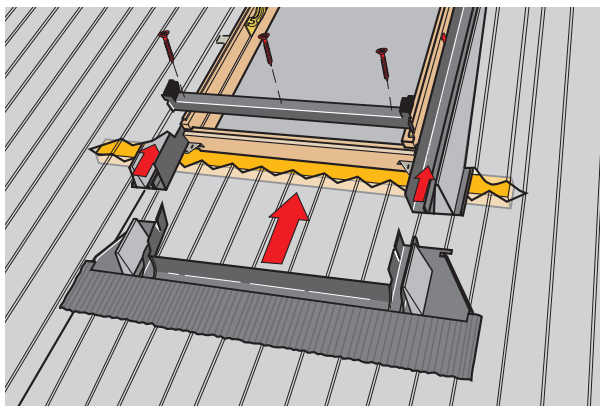


Special roofing materials

Profiled metal sheets

5

Install window as shown in the installation instructions for the window.



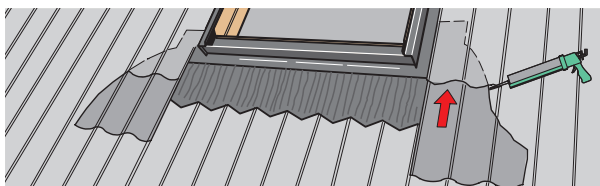
Position side flashings under the metal sheet roof and under the top flashing section. Remember to adjust foam gaskets.

Bend the flexible part of the bottom flashing section and fit bottom flashing section. Note that the sides of the bottom flashing section must be fitted under the side flashings.

Fit covers.

Shape infill pieces from the rest of the metal sheets and fit so that all cuts are covered.

Fix infill pieces with rivets (seal holes with silicone if necessary).



Special roofing materials

Metal sheets with pre-formed standing seam

Use flashing EDW for installation of VELUX roof windows in roofs with pre-formed steel sheets that are clicked together.

Note! Flashing EDE can be used for pre-formed zinc or aluminium metal sheets, see page 76.

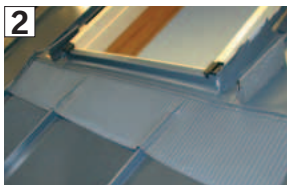
Install the window as shown in the installation instructions for the window. Follow normal procedure for connection of underfelt and insulation.

Position the metal sheets below the bottom frame, not closer to the frame than the bottom installation batten. The sheet must continue at least 200 mm past the frame at the sides to make space for fitting the bottom flashing section (1).

Fit the bottom flashing section and shape the flexible part of it around the ribs of the metal sheets. Bend the bottom flashing section as shown in the installation instructions so that it presses against the metal sheets (2).

Fit the flashing around the window and cut the foam gasket to a height of approx 25 mm. Flatten the rib of the top flashing section on both sides (3).

Position metal sheets around the window. The distances from the metal sheets to top and side frames follow the standard instructions. Fix metal sheets around the window with screws with tightening washers. Do not screw through the flashing (4).



Special roofing materials

Decra roofing panels

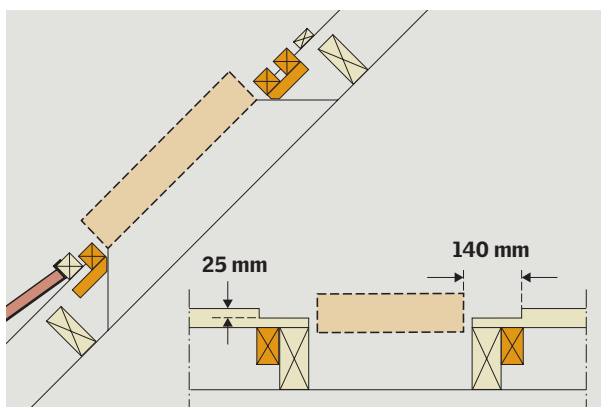
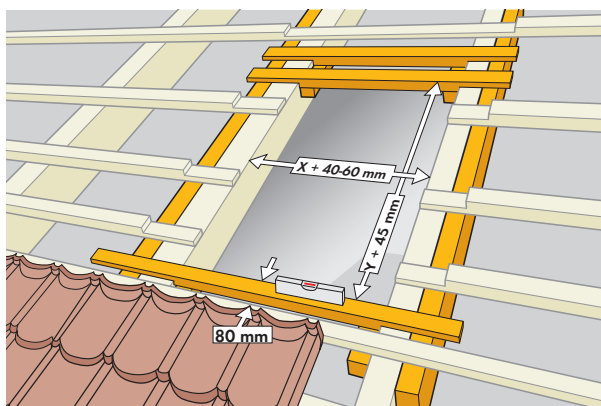
5

Use flashing EDW for installation of VELUX roof windows in roofs with Decra roofing panels.

The lowest level of these roofing panels is below the top face of battens. This means that window and flashing must be installed correspondingly deeper in the roof.

Establish a recessed area around the window for the flashing. This area must be 25 mm below the top face of the battens. Ensure support of the battens as their load capacity is reduced.

Note! If it is not possible to keep a full roofing panel below the roof window, please contact VELUX.



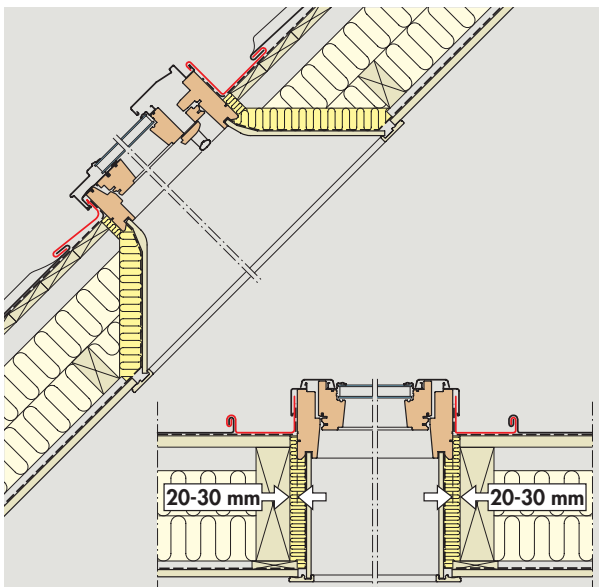
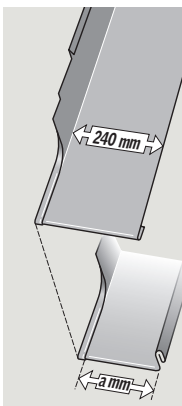
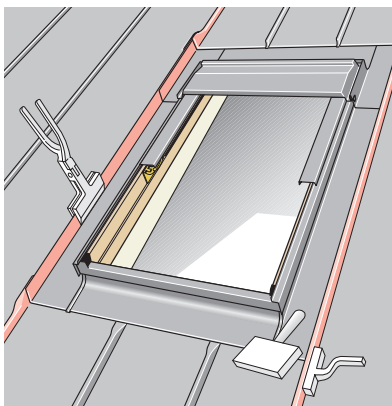
Special roofing materials

Traditional standing seam roofs

Use flashing EDE for installation of VELUX roof windows in roofs with traditional zinc or copper roofing sheets.

Install the window as shown in the installation instructions for the flashing.

Observe position of the window and the distance to the nearest seam. The width of the EDE flashing side sections is 240 mm. If wider side sections are needed, order flashing EDE-Y with 630 mm wide side sections.



Special roofing materials

Slate

5

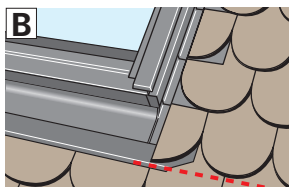
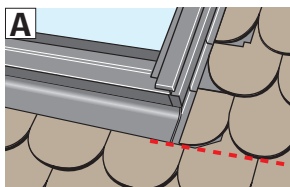
Use flashing EDL for installation of VELUX roof windows in slate roofs.

A slate roof is tight because of the overlapping of the individual slates. The required overlap depends on the roof pitch, local climatic conditions etc.

When flashing a roof window in a slate roof, the flashing parts must be fitted in such a way that they "replace" the slates that were removed when the window was installed.

Therefore, when determining the position of the window in the roof, the EDL bottom flashing section must be considered, ie it must be flush with the slates thus "replacing" the slates removed (**A**).

If this is not possible, required overlap must be established in a different way, eg by fitting an extension piece under the bottom flashing section (**B**).



The EDL flashing is designed for slates with a thickness of up to 8 mm (**1**). By adjusting the side soakers, the flashing can be installed in slates with a thickness of up to 20 mm (**2**).

Special installation instructions (EDL+) are available, please contact VELUX Company Ltd.



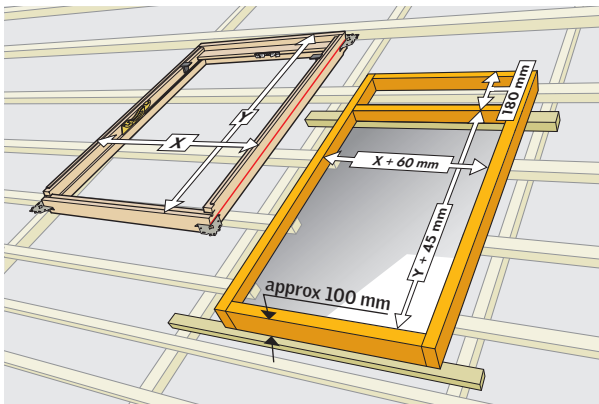
Special roofing materials

Thatched roofs

Use flashing EDW with flashing kit ZZZ 166 (pleated aluminium roll) for installation of VELUX roof windows in thatched roofs.



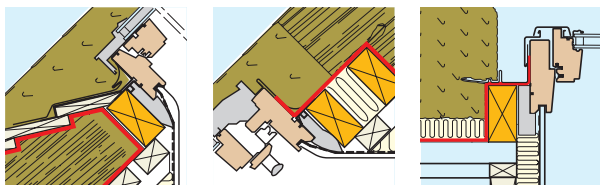
Build a frame from 45 x 95 mm members as shown. Position frame on battens and fix to roof construction. Install window on this frame.



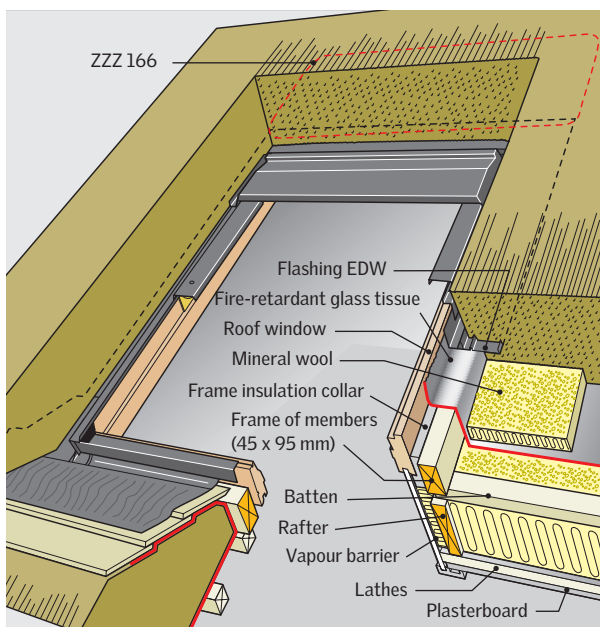
Special roofing materials

Thatched roofs

5



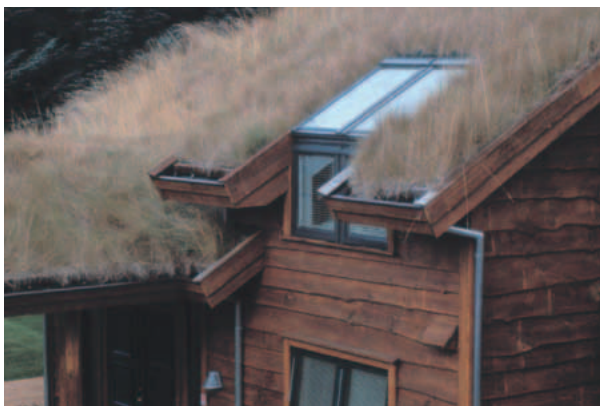
The drawing shows the principles for installation of a roof window in a roof construction with fire-retardant glass tissue. The roof construction must always be adjusted to the specific building, local architectural tradition and the directions of the building material supplier.



Special roofing materials

Grass roofs and the like

Use flashing EDL for installation of VELUX roof windows in grass roofs and other types of roofing with a thick layer of natural materials.



In these roof constructions a membrane under the natural material ensures a tight seal around the installation. The membrane is led from the roof surface to a built-up platform and up along the sides of the frame all around the window.

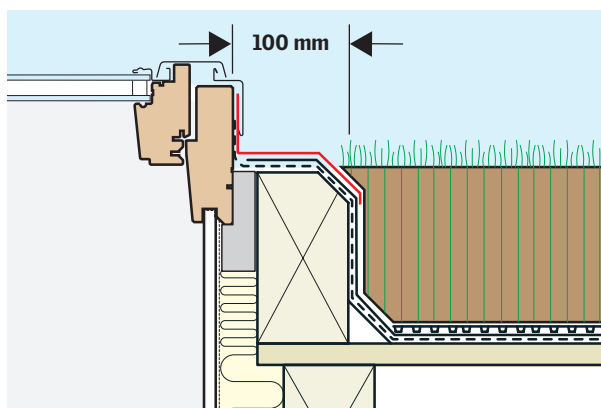
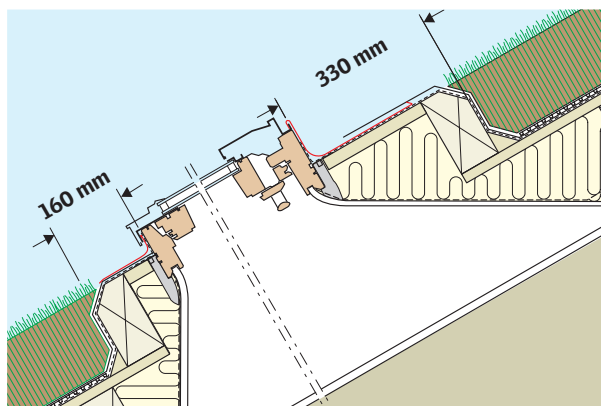
Establish frame within the dimensions shown. The platform must be level with the natural material. Chamfer the edges of the frame to reduce the possibilities of the membrane cracking or splitting. Establish transverse drainage above the frame.

If the membrane consists of two layers, position both layers before fitting the flashing. Fit the flashing all around the window. Fold down edges of flashing over the platform at the sides so that the natural material can cover the edges of the flashing. Position a humus resistant flashing component over the top flashing section. Bend the flashing component so that it follows the upper side of the frame. This flashing component is not supplied by VELUX.

Special roofing materials

Grass roofs and the like

5



Replacement of roof window	84-87
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Replacement / Renovation

Replacement of roof window

A VELUX roof window is designed to last for many years. A minimal amount of maintenance ensures a fully functional window provided that the gaskets of the window and the foam gaskets of the flashing, if any, are replaced as and when required (see page 89).

VELUX is continuously working to improve the products, and therefore it will at some point be an advantage to replace the window instead of renovating the old one.

TO BE CONSIDERED BEFORE REPLACEMENT

VELUX can assist in finding a suitable solution for replacing old windows – regardless of size and brand.

Advantages when replacing the old window with a new VELUX roof window:

- improved U-value – and therefore better comfort
- possibility of choosing another window type – eg changing from a centre-pivot to a top-hung window, from a timber to a poly-urethane window or from manual to electrical or solar operation. Solar operated windows are particularly adaptable for this replacement application as they require no connection to the mains power supply, see page 117 for further details.
- more attractive design – better integration in the roof
- guarantee for tightness and insulation around the window when using VELUX installation products together with the window

Since 1973 VELUX has produced windows with standard dimensions. It is therefore almost always possible to get a new window with dimensions that match those of the old window.

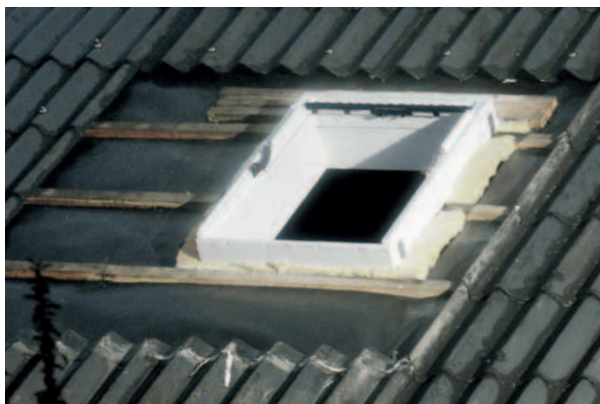
VELUX roof windows produced later than October 1998 are installed 27 mm deeper in the roof surface to ensure better heat insulation. Therefore, in a replacement situation choose one of the following options (see the examples on pages 86-87):

- A** Replacing lining
- B** Keeping lining but reduce their depth
- C** Keeping lining without alterations
- D** Replacing with one larger window or with more windows

Replacement / Renovation

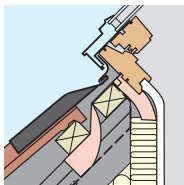
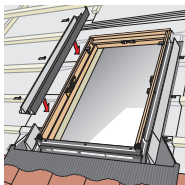
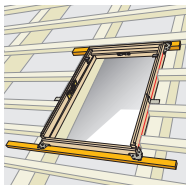
Replacement of roof window

6



Replacement / Renovation

Replacement of roof window

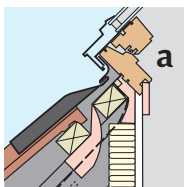
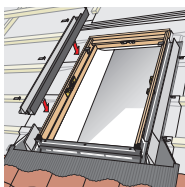
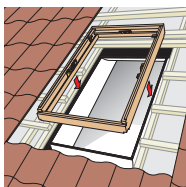


A. REPLACING LINING

Install the roof window following standard procedure and with a standard flashing.

VELUX installation products BDX, BFX and BBX should be used if possible.

Note! When using VELUX linings while maintaining the old window opening, the lining must be specially adjusted (see page 88).

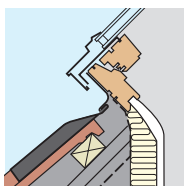
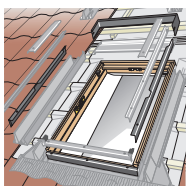
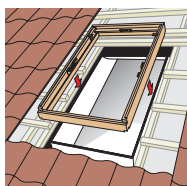


B. KEEPING LINING BUT REDUCING DEPTH

If the window to be replaced is from before October 1998, the new window will be installed deeper in the roof than the old window. This means that the lining must be reduced by 27 mm on all sides. Position frame in the lining and secure with installation brackets.

Fit standard flashing following standard procedure. The lining fits at the sides but it is necessary to fit facings (a) at top and bottom.

VELUX installation products BDX, BFX should be used if possible. The frame insulation collar from installation set BDX may have to be adjusted at the top or bottom.

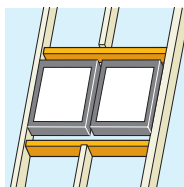
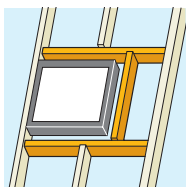
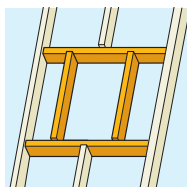


C. KEEPING LINING WITHOUT ALTERATIONS

The replacement window will be installed above its normal installation height therefore a special flashing is required. For single windows use flashing EL for slates or EW for tiles. Extension flashing ELX together with standard combi flashings are used when replacing combined windows.

Position the frame on the lining and secure with brackets supplied with the flashing. The complete installation is described in the installation instructions supplied with the flashing.

VELUX underfelt collar BFX can be used, but not the frame insulation collar from installation set BDX.



D. REPLACING WITH ONE LARGER WINDOW OR MORE WINDOWS

This is equivalent to a new installation. Therefore, it should be considered whether the rafter spacing allows for a wider window. If not, trimmers must be installed.

Replacement / Renovation

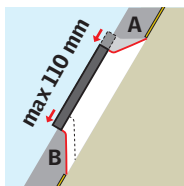
Roof renovation

When changing from one roofing material to another, the position of the new roof windows may have to be shifted slightly. Changed batten spacing may require that the position of the window is moved upwards/downwards to allow for correct installation and relationship to the new roofing material.

To be able to maintain the interior opening without having to fill any gap between lining and interior opening, adjust the angle of the top or bottom element of the VELUX lining (screws lines 1 and 4 below refer to the template supplied with the lining).

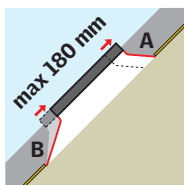
60° ROOF PITCH

The window can be lowered up to 110 mm. Position the top element (A) in screw line 4. If the window is raised the lining cannot cover the interior opening.



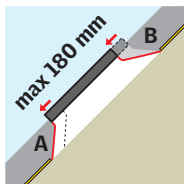
45° ROOF PITCH

The window can be raised up to 180 mm. Position the bottom element (B) in screw line 1.



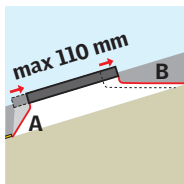
45° ROOF PITCH

The window can be lowered up to 180 mm. Position top element (B) in screw line 1.



15° ROOF PITCH

The window can be raised up to 110 mm. Position bottom element (A) in screw line 4. The lining cannot cover the interior opening if the window is recessed into the roof opening, ie with flashing EDL.



Replacement / Renovation

Spare parts

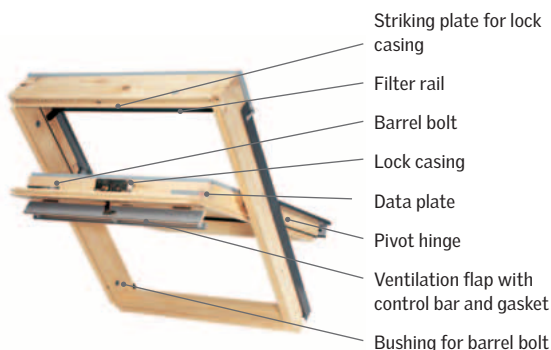
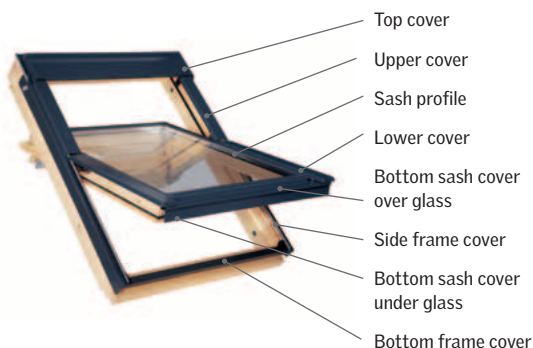
6

VELUX products are designed to last for many years, even with a minimal amount of maintenance. Wearing parts must, however, be replaced at regular intervals. Consequently, VELUX offers a wide range of spare parts that are available many years beyond the time of purchase.

To make maintenance easy for you, VELUX offers various DIY service kits (general maintenance, repair lacquer etc).

For more information visit **www.velux.co.uk** or **www.velux.ie** where you will find information about how to order spare parts. When ordering, state window type and size that appear from the data plate of the window.

For further information, please contact VELUX Company Ltd.



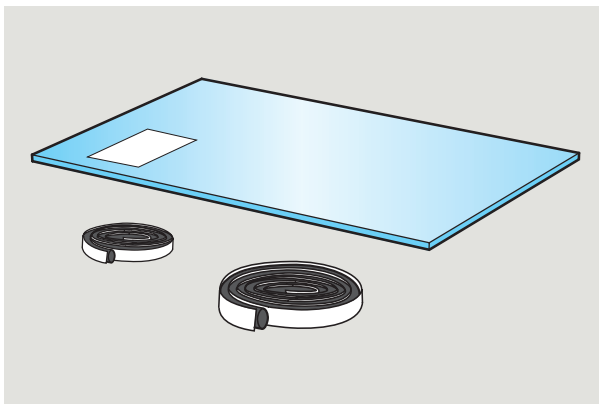
Replacement / Renovation

Replacement of insulating glass unit

VELUX offers complete replacement kits, if replacement of the insulating glass unit in a roof window is required.

A replacement kit includes all necessary components:

- New insulating glass unit (choice of units with different qualities)
- Sealant
- Complete set of instructions



The replacement kit is available from **www.velux.co.uk** or **www.velux.ie**. Remember to state window type and size from the data plate of the window.

The replacement kit is delivered in a cardboard packaging that can also be used for disposal of the replaced insulating glass unit.

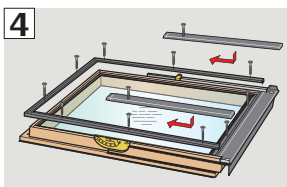
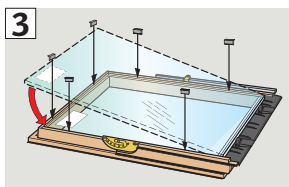
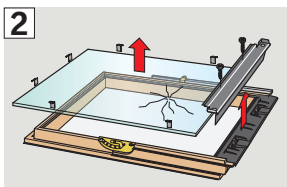
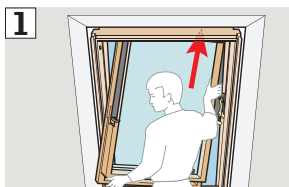
Replacement / Renovation

Replacement of insulating glass unit

6

The procedure is simple:

1. Remove sash and place eg on trestles.
2. Unscrew covers and sash profile and lift out the old insulating glass unit.
3. Place new insulating glass unit in sash.
4. Refit sash profile and covers and replace sash.



Replacement / Renovation

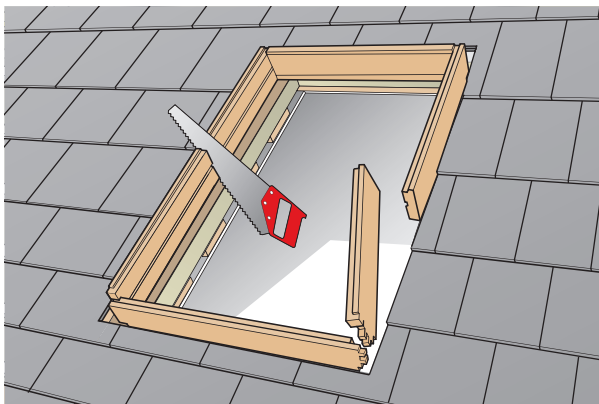
Replacement of roof window in slated roof

Use flashing EDL when replacing an old window with a new one in roofs with slates. In most cases, the installation instructions for flashing EDL can be followed.

If it is either not desirable or not possible to remove the slates, follow this procedure:

REMOVING THE OLD WINDOW

1. Remove the window sash and all window covers.
2. Saw the side frames and remove carefully.
3. Carefully draw out side soakers and top and bottom flashing sections. If the components are stuck in slate putty, loosen the individual slate layers carefully from the flashing components with a hand saw.
Remove putty from between the slate layers with the hand saw.



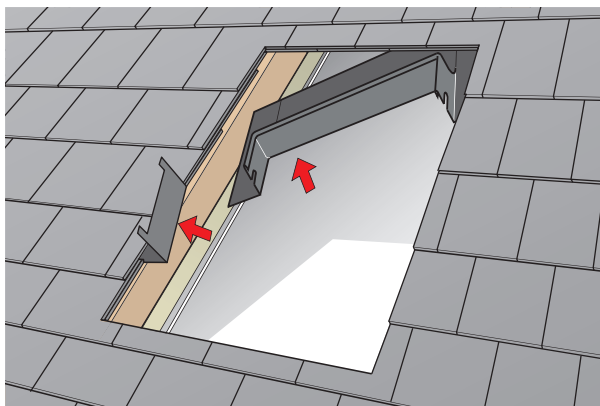
Replacement / Renovation

Replacement of roof window in slated roof

6

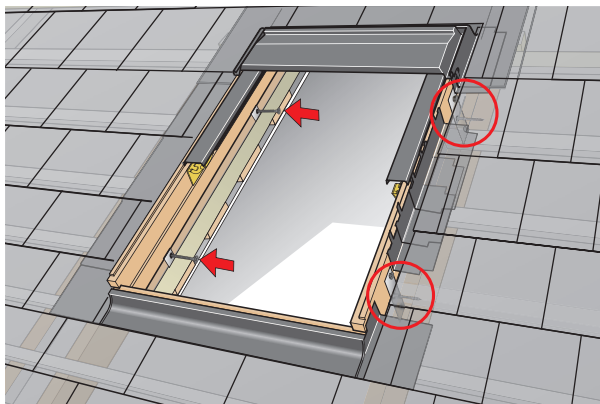
POSITIONING THE NEW FLASHING

4. Apply slate putty to the top flashing section and push it diagonally up between the slates.
5. Apply slate putty to the side soakers and position between slate layers. Follow the same procedure when fitting the bottom flashing section.



POSITIONING THE NEW ROOF WINDOW

6. Fit four pieces of flat bar to the side frames.
7. Fit blocks on rafters to establish base for fixing of flat bars.
8. Lift frame into position from the inside and fix.
9. Follow standard procedures for fitting of exterior covers and interior lining.

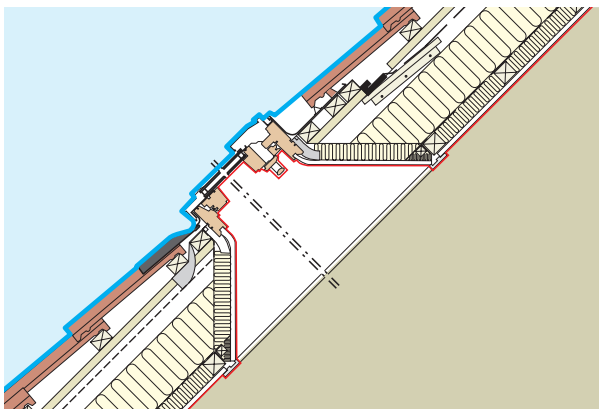
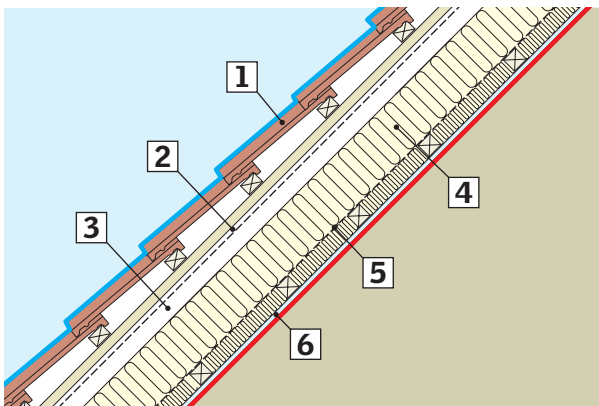


Roof construction	96
Roofing material	97
Underfelt	98-100
Bearing construction	101-102
Thermal insulation – U-value	103
Vapour barrier	104-105
Interior ceiling finish	106
Ventilation of habitable rooms	107
Sound insulation	108
Snow and ice around VELUX roof windows	109

A modern roof is a complicated construction consisting of many different materials with many different functions.

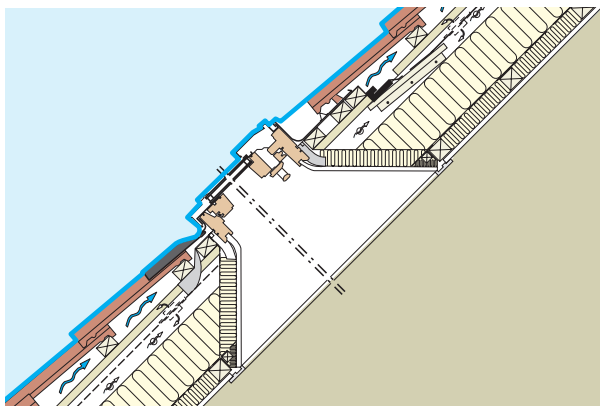
1. **Roofing material** – primarily protects against water (rain and snow), hail etc
2. **Underfelt** – protects against rain and snow and serves partly as wind barrier
3. **Bearing construction** – rafters, battens
4. **Heat insulation** – minimises heat loss
5. **Vapour barrier** – prevents air and vapour penetration
6. **Interior ceiling finish**

When this construction is interrupted by the installation of a roof window, there are of course demands to maintain the integrity of the roof construction and the connections between the window and the individual components within it.



The roofing material makes up the exterior weathershield that is the primary protection against precipitation.

Roofing materials are available in a large number of types and materials but regardless of this condensation will form on the underside of the roofing material and this moisture must be ventilated to the outside. Therefore there must be a ventilation path under the roofing material.

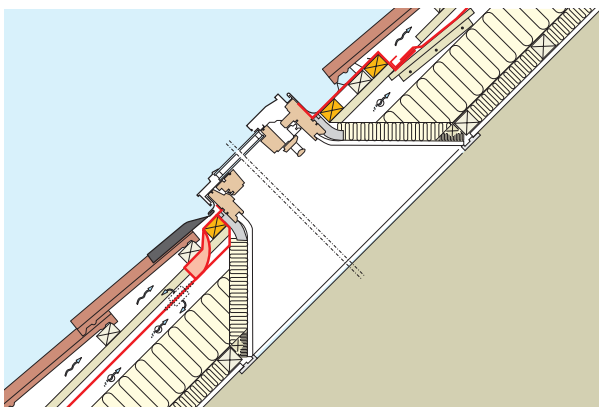
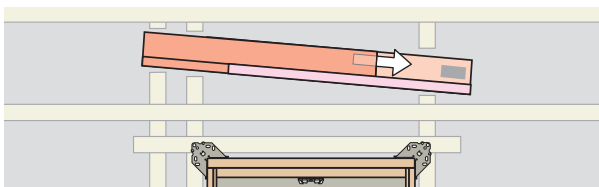


Building physics

Underfelt

The underfelt protects the roof construction against harmful water penetration, primarily from leakages in the roofing material. These leakages mean that wind driven rain and snow may penetrate the roofing material. Especially driving snow may cause problems if there is no underfelt. Large amounts of snow may accumulate over time and suddenly melt when the temperature rises.

Water that runs down the underfelt ends in the gutter. If the underfelt is interrupted by eg a roof window, the water must be drained off to the sides of the window by installing a drainage gutter. The drainage gutter drains off the water to the adjoining roof section (between two trusses) where it can continue down the underfelt.



As a result of eg small leakages in the vapour barrier small amounts of moisture may enter the roof construction from the inside of the building. This moisture must be removed in order to avoid moisture problems with subsequent rot and dry rot.

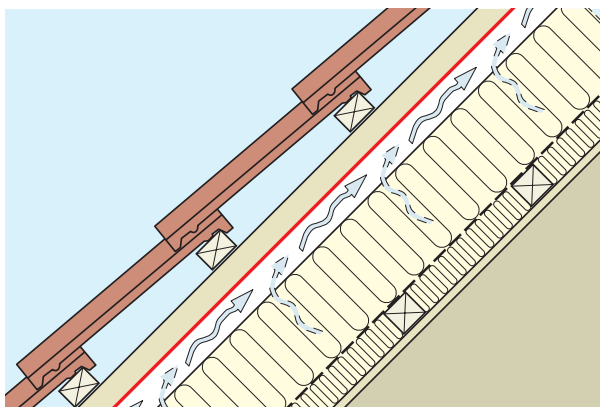
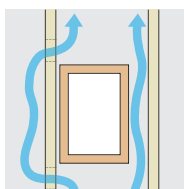
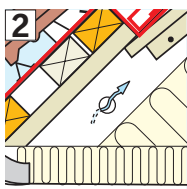
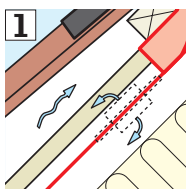
Depending on the means to removing the moisture, underfelts are divided into ventilated and unventilated underfelts.

VENTILATED UNDERFELTS

Ventilated underfelts are made of diffusion tight materials. The moisture is removed from the roof construction as the cavity between insulation and underfelt is ventilated with fresh air. The air circulation under a ventilated underfelt may be obstructed in one or more roof sections when a window is installed. To ensure ventilation in the roof section affected, it is recommended either:

- to fit ventilation pieces in the underfelt material **(1)** or
- to establish ventilation holes at the top of the rafters **(2)**, so that air can flow to/from the adjoining roof section.

This must be done both above and below the window.



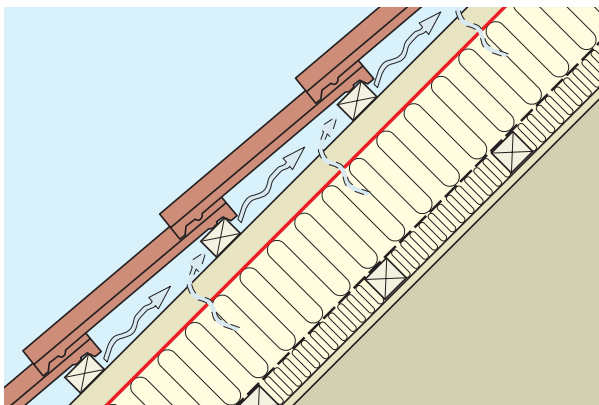
The lack of a ventilation path below the underfelt may result in accumulation of moisture in rafters and insulation material. This may reduce the performance of the insulating layer and cause rot damages.

UNVENTILATED UNDERFELTS

Unventilated underfelts are based on diffusion open materials that are positioned directly on the insulating material. The small amounts of moisture that via diffusion through the vapour barrier percolate through from the interior of the building to the roof construction continue through the underfelt material. From here the moisture is removed by the ventilation under the roofing material.

As diffusion is not by far as effective as ventilation, it is very important that the vapour barrier is absolutely airtight. The diffusion capacity of the underfelt is not sufficient to compensate for leakages in the vapour barrier.

VELUX underfelt collar BFX is made of diffusion open material and can thus be used for unventilated underfelts. The method for fitting the underfelt collar is the same for ventilated and unventilated underfelts.

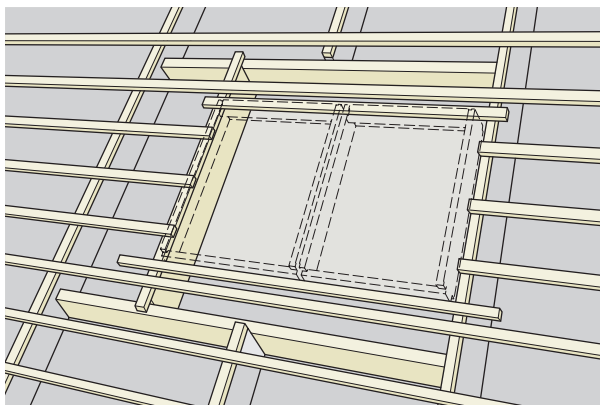


Sometimes the wish for a special VELUX solution requires adjustment of the roof construction in order to create sufficient space. The need for such changes may have a deterrent effect on both customers and installers, but often the problems are not so big if the entire installation is thoroughly planned from the start.

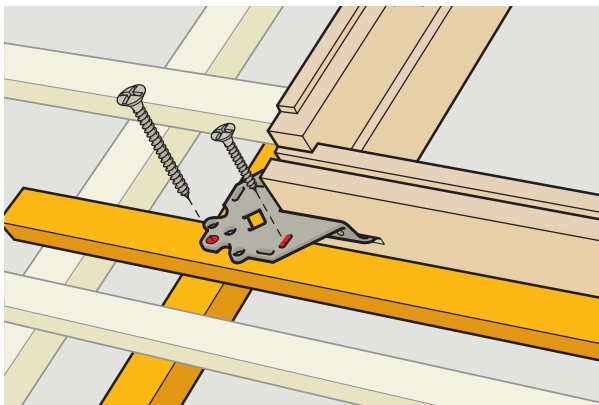
Old roof constructions are often based on tradition and experience. Changes to these roof constructions are therefore made on the basis of traditional craftsmanship and experience with a fair share of reason and caution.

In new roof constructions where the bearing elements are often factory-made, the construction systems and materials have been optimised on the basis of calculations. Any change/weakening of the bearing system in these roof constructions may impair the construction beyond calculated permissible safety limits. Factory-made rafters are most often marked with manufacturer identification and it is recommended to seek advice from the manufacturer or a structural engineer before making changes in such constructions.

The extra time and materials required to make a correct structural change are relatively moderate considering that the roof construction is already accessible.



VELUX roof windows are fixed with corner brackets with long screws through the battens to the underlying rafter construction. As the installation battens are not really bearing elements, there are no specific requirements as to the strength of the battens.



Basically, thermal insulation of constructions is made to delay the inevitable equalisation of the temperature between warm and cold air and between warm and cold building components. This means that somewhere in the construction there must be a layer of insulation material.

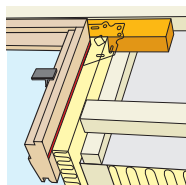
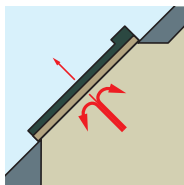
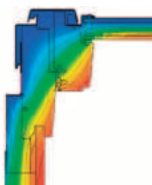
The heat conducting capacity of a material is called the lambda-value (λ) and is measured in $W/(mK)$. The lower the lambda-value of a material the poorer the heat conducting capacity and thus the better insulating capacity.

When different materials are combined in the same component, the lambda-value of each material contributes with a certain share to the total heat conducting capacity. This capacity of components is called the U-value, or the thermal transmittance coefficient and is measured in $W/(m^2K)$. Also in this case the insulating capacity is better the lower the U-value.

In a VELUX roof window two components specifically have an influence on the total U-value of the window.

The **insulating glass unit** accounts for the largest share of the total thermal loss through the window. The insulating capacity of the insulating glass unit has a great impact on the comfort in the area close to the window as a poorly insulated insulating glass unit will cool the air. The cold air will flow from the insulating glass unit as a downdraught.

The **frame** and its connection to the roof construction cover a smaller area. Appropriate insulation around the frame is, however, essential as insufficient frame insulation results in lower surface temperatures and thus a risk of condensation on the interior surfaces. The stated U-value of a VELUX roof window applies only if the frame is insulated carefully up to the upper side of battens. The required level of insulation can be achieved using the VELUX frame insulation collar from installation set BDX 2000.



Building physics

Vapour barrier

The vapour barrier is a membrane of a diffusion tight material positioned on the warm side of the construction of the house. It prevents vapour from the warm indoor air from reaching the colder air/surfaces within the wall or roof construction.

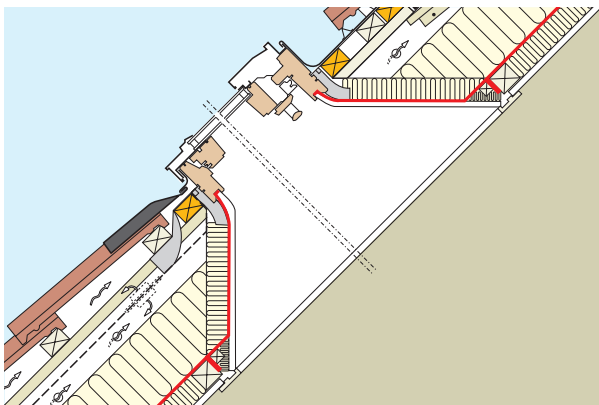
If the warm air is not stopped the vapour will condensate on the cold surfaces. In periods with frost this will result in accumulation of ice.

In this way more moisture enters than escapes the construction creating ideal conditions for damaging rot and dry rot.

In addition to reducing the strength and life time of the building construction dry rot may also result in an unhealthy indoor climate.

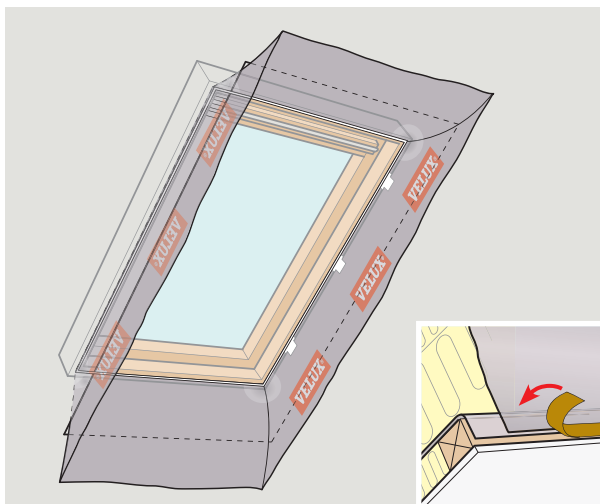
This makes the vapour barrier one of the most important components in the construction of the building!

Therefore it is very important to the performance and life time of the construction that the vapour barrier is fitted correctly ensuring absolute air tightness. Especially observe that details such as joints, penetrations and connections to other components of the construction are airtight.

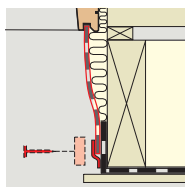
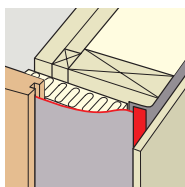
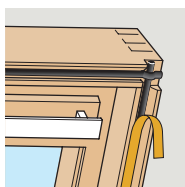


When a VELUX roof window is installed any vapour barrier present is penetrated. It must be re-established with a membrane that connects the window to the vapour barrier within the roof/wall construction.

VELUX vapour barrier collar BBX is the easiest solution.



If the membrane used is not a VELUX vapour barrier collar BBX, this membrane must be connected to the window rebate at the frame with butyl or acrylic joint filler to ensure tightness. Where the window aperture meets the interior ceiling the membrane must be connected to the vapour barrier of the house by means of tape or tight overlapping joint.



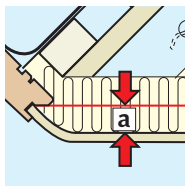
To complete the hole in the roof construction on the interior side a lining must be established.

The lining is of great importance to the performance and to the overall impression of the window.

- The top should be horizontal and the bottom vertical so that warm air from a heat source below the window can keep the inner glass pane heated and prevent the possibility of condensation occurring. This shape also allows more light into the room.
- Top and bottom positioned at right angles to the window would on the other hand make the window seem smaller and even impair the view. It may also allow for cold areas at the bottom of the window allowing condensation to occur.
- Note that the colour of the lining has an influence on the amount of light reflected from the lining into the room.

VELUX linings are, of course, designed to meet these requirements. In addition VELUX linings offer further advantages that cannot be obtained with a made-on-site lining.

- The curved top and bottom lining elements allow for more insulation (a).
- VELUX linings are fitted directly in the window rebate. It is not necessary to provide additional framing for the lining.
- VELUX linings are factory finished and further treatment is not required.



One person secretes approx 3 l of water vapour a day via the exhalation air. Additionally, in a standard one-family house 15 l of water vapour a day are generated from bathing and cooking. This will result in an increase in the level of humidity if the indoor air is not renewed.

A high level of humidity creates mould and mould fungus that can cause both health problems and damage to building components. Therefore, to comply with building regulations, a minimum of air renewal must be provided in dwellings to maintain a good indoor climate and reduce the effects of moisture on the construction of the house.

Of course, the amount of smell and moisture effect differs from dwelling to dwelling. In addition to the building regulation requirements by observing the following general guidelines it will in most cases be possible to maintain a low level of humidity.

- It is recommended to air habitable rooms 3-4 times a day, each time for 5-7 minutes.
- Rooms with a high level of humidity such as kitchens and bathrooms must be aired with mechanical air extraction.
- Heating should not be turned off during airing as the cold outdoor air should be heated immediately after the windows have been closed again.
- Rooms should not remain unheated for long periods of time as this results in an elevated level of humidity. If the bedroom is kept cold at night, it should be re-heated during the day.
- Avoid drying laundry indoors.

When airing briefly, walls and furniture do not get cooled and consequently the heat loss is minimal.



In buildings sound spreads from room to room and from the outside to the inside in two different ways; partly as airborne sound where air pressure waves spread through crevices in the constructions and partly as structural sound that is transmitted via vibrations in solid materials.

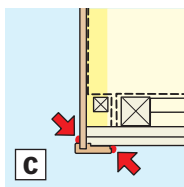
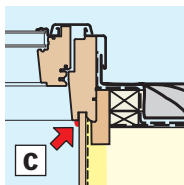
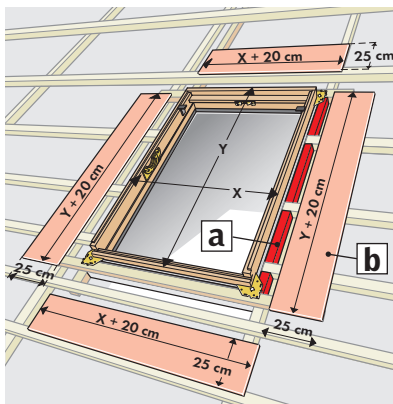
The airborne sound can be reduced by carefully sealing crevices in the construction. Structural sound can be diminished by separating the constructions or by using high density building materials.

If there are special demands to sound insulation when installing a VELUX roof window, roof window GGL in the special sound insulating variant --62 can be used. The construction of this variant has been optimised with regards to sound insulation and the insulating glass unit has an additional 8 mm layer of glass.

In addition to this, the installation must be carried out so that the connection between the window and the roof construction ensures effective sound insulation.

This may be ensured by:

- fitting infill battens along the window frame (**a**),
- fitting strips of heavy bituminous roofing felt under the underfelt collar (**b**) and
- sealing connections through which airborne sound may pass (**c**).



In prolonged cold periods with heavy snowfall considerable amounts of snow may accumulate on the roof and a VELUX roof window could become covered.

When the temperature rises the window will often be the first place where the snow starts melting because of the small extra heat loss on and around the window. Melt water will run down the window and freeze once it reaches the colder, better insulated roof surface below the window.

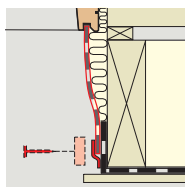
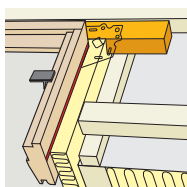
In such cases a bank of ice can form below the window damming newly melted water and thus causing water ingress around the window. Neither the window nor the roof surface is designed to resist this.

To avoid such problems, make sure that water can always drain off from the bottom section and along the sides of the window.

Banks of snow and ice should therefore be removed from the area around the window in the same way as leaves and other debris should be removed from flashing and gutters to allow rainwater to flow freely.

Note! When installing windows in areas with severe weather conditions, extra measures should be taken:

- Always include underfelt and ensure a tight connection to the window. Roofing materials are not designed to resist dammed up water.
- Avoid thermal bridges by insulating carefully around the window.
- Pay extra attention to the vapour barrier to avoid moisture penetration around the window.



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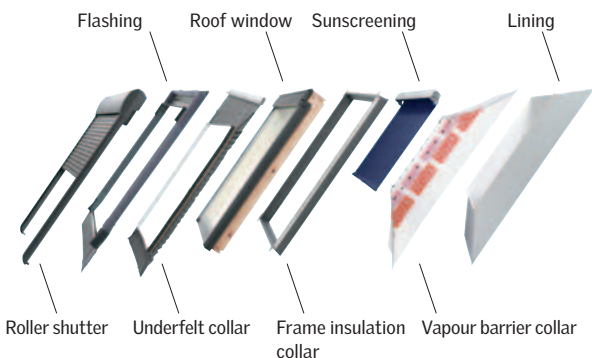
Product information

Product types

The VELUX roof window is the key product in the VELUX product programme.

But in addition to this, VELUX offers a wide range of different product types that together ensure correct installation and optimum functionality of the roof window in all situations.

This chapter describes the various product types.



In order to comply with customer demands in the best possible way the VELUX products are available in many different standard sizes and variants.

To be able to handle and describe this product system in a simple way, VELUX uses product codes with ten characters divided into three 'blocks'.

Examples

Type designation

GGL

EDW

Size code

M08

M08

Variant code

3059

2000

TYPE DESIGNATION

The first three characters in the product code of any VELUX product is the type designation.

The first letter in the type designation indicates the product family. Here are some examples:

G-- indicates a roof window, eg **GGL**

E-- indicates a flashing, eg **EDW**

B-- indicates an installation product, eg **BDX**

L-- indicates a lining, eg **LSB**

S-- indicates a roller shutter, eg **SML**

SIZE CODE

The second block consisting of one letter and two digits indicates the size of the product. The size code of the window indicates the exterior frame dimensions.

Eg C04 = 550 x 980 mm (w x h)
 M08 = 780 x 1400 mm (w x h)

The code refers to the position in the VELUX size chart (see page 151).

The size code of other products indicates which window the product matches.

Note! All sizes are not marketed but can be obtained to order.

VARIANT CODE

Most products are available in various materials and with various surfaces. Window covers and flashings that are as standard made of aluminium are also available in copper and zinc. Insulating glass units are available with special qualities etc.

The four digits in the variant code define the different types of materials and surfaces.

Note! Possible variants appear within the various sales brochures.

Product information

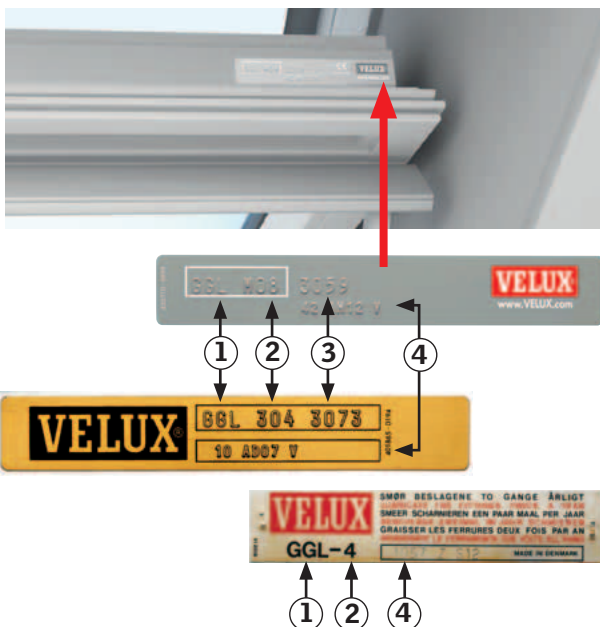
VELUX product and order codes

DATA PLATE

All VELUX roof windows are equipped with a data plate with precise information about the window. On roof windows with control bar the data plate is placed on the top right hand side of the sash behind the ventilation flap.

When ordering eg an insulating glass unit, spare parts or accessories, state code from the data plate. This ensures delivery of the correct product when ordering.

- ① Type designation
- ② Size code
- ③ Variant code
- ④ Production code





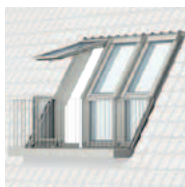
VELUX roof windows are available as centre-pivot windows with the type designations GGL and GGU and as top-hung windows with the type designations GHL, GHU, GPL and GPU.

Windows with a type designation ending in --L, eg GGL, are traditional timber windows. Windows with a type designation ending in --U, eg GGU, are polyurethane windows with a timber core. Polyurethane windows are especially suited for rooms with a high level of humidity or when low maintenance products are required.

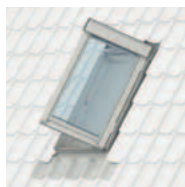
The range of VELUX roof windows also includes the CABRIO® Roof Balcony, the Roof Terrace and windows with special characteristics and application areas, eg Conservation Roof Window, Flat Roof Window and Smoke Ventilation System.



Roof Balcony

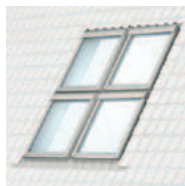


Roof Terrace



**Conservation
Roof Window**

All VELUX roof windows can be installed individually as well as in combinations side by side and/or over/under each other (see chapter 3).



Product information

Centre-pivot roof windows



GGL – timber window

GGU – white polyurethane window

Characteristics:

- Can be installed in roof pitches from 15° to 90°
- Can be opened/closed with the control bar at the top
- Features ventilation flap with air filter



GGL INTEGRA® – timber window

GGU INTEGRA® – white polyurethane window

Characteristics:

- Electrical variants of GGL/GGU delivered with integral motor and control
- Operated with wireless remote control based on io-homecontrol® technology (see page 132). Can also be operated manually
- Delivered with rain sensor that ensures automatic closing of the window in case of rain
- Prepared for subsequent fitting of electrically operated sun-screening products

Apart from the above, the windows have the same characteristics as GGL/GGU.



GGL Solar – timber window

GGU Solar – white finish polyurethane window

Characteristics:

- Solar driven variants of GGL/GGU delivered with integral motor and control
- Wireless installation
- Operated with wireless remote control based on io-homecontrol® technology (see page 132). Can also be operated manually
- Delivered with rain sensor that ensures automatic closing of the window in case of rain
- Can be combined with a broad range of solar driven sunscreening products

Apart from the above, the windows have the same characteristics as GGL/GGU.

Product information

Top-hung roof windows



GPL – timber window

GPU – white polyurethane window

Characteristics:

- Can be installed in roof pitches from 15° to 55° (with special springs up to 75°)
- Can be opened closed/closed with a handle at the bottom
- Features ventilation flap with air filter
- Can stay open in all positions up to 45°
- Can be used for emergency escape, see page 9



GHL – timber window

GHU – white polyurethane window

Characteristics:

- Can be installed in roof pitches from 15° to 55° (with special springs up to 75°)
- Can be opened and closed with a handle at the bottom
- Features ventilation flap with air filter
- Can be maintained in three fixed opening positions up to 30°
- Can be used for emergency escape, see page 9



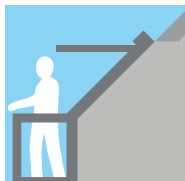
GDL - CABRIO® Roof Balcony

Characteristics:

- Can be installed in roof pitches from 35° to 53°
- The top-hung upper section is opened/closed with a handle at the bottom
- The upper section can stay open in all positions up to 45°
- The upper section features ventilation flap with air filter
- The bottom-hung lower section is opened/closed with two handles on the top sash
- The bottom section has integral banisters that automatically slide into position
- Is delivered complete with flashing
- Only available in timber version
- Can be installed in combination with roof windows GPL and GIL

Product information

Roof Terrace



35°-53°

GEL – upper section: a modified top-hung roof window

VEA – lower section: hinged on the left hand side, outward opening sash

VEB – lower section: hinged on the right hand side, outward opening sash

VEC – lower section: fixed (not opening) sash

The VELUX Roof Terrace is a combination of upper and lower sections which when opened allow access to a roof terrace. Because of structural considerations a roof terrace can contain only one VEA/VEB opening lower section.

The terrace floor and railing are not supplied by VELUX.

Characteristics:

- Can be installed in roof pitches from 35° to 53°
- The upper section is opened/closed with a handle at the bottom
- The upper section can stay open in all positions up to 45°
- The upper section features ventilation flap with air filter
- Lower sections VEA/VEB are opened/closed with a handle on the side sash
- When both upper and lower sections are open, there is free access to the roof terrace
- Is delivered complete with flashing and adjustable support rafter EBY W10 3100
- Only available in timber version



GGL/GGU ----40 – Smoke Ventilation System

Characteristics:

- Can be installed and used for venting of smoke in roof pitches 15°-90°
- Optimised geometric and aerodynamic venting area
- System comprises centre-pivot roof window GGL with pre-installed motor with flashing or kerb for flat roof installation, control unit, break glass point and smoke detector
- The control unit can control up to 2 smoke ventilation windows
- Certified according to EN 12101-2

Product information

Additional elements



GIR - arched

GID - triangular

GIV - rectangular

Characteristics:

- Upper element with fixed sash
- Can be installed in roof pitches from 20° to 85°
- Can only be installed above a VELUX roof window
- Is installed frame-to-frame with the roof window below
- Only available in timber version



GIL - timber window

GIU - white polyurethane window

Characteristics:

- Rectangular lower element with fixed sash
- Can be installed in roof pitches from 15° to 90°
- Can only be installed below a VELUX roof window
- Is installed frame-to-frame with the roof window above



VFE - timber window with bottom-hung, inward opening sash
The window is opened/closed with a handle on the top sash.



VFA – timber window, tilt and turn – hinged on the left hand side, inward opening sash.

VFB – timber window, tilt and turn – hinged on the right hand side, inward opening sash.

The windows are opened/closed with a handle on the side sash.

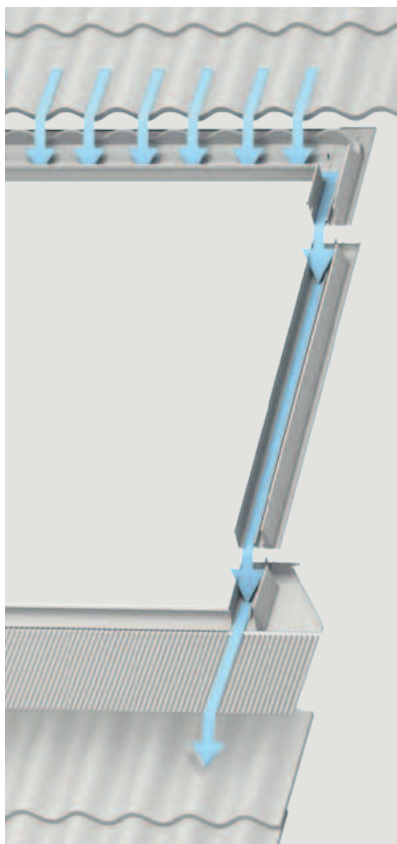
The vertical window elements **VFE/VFA/VFB** are installed vertically below a VELUX roof window installed in a roof pitch between 15° and 55°.

Product information

Flashings

VELUX flashing system ensures a watertight connection between the roof window and the roofing material.

Like the roofing material, the flashings drain off water resulting from normal weather conditions. The flashings are not 'submarine tight' and therefore it must be ensured that water cannot accumulate around the window. To avoid this happening it is important to observe the relationships between the window, flashing and roofing material as indicated within the installation instructions.



THE FLASHING SYSTEM

The wide range of different types of VELUX flashings ensures that tested standard solutions are available for most roofing materials and installation situations.

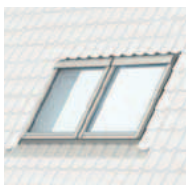
The type designation for flashings consists of three letters.

The first letter in the type designation is always an **E**, eg **EDW**.

The second letter refers to the installation situation, eg **EDW**.



ED-
Single flashing



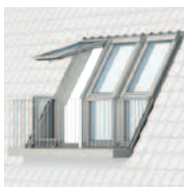
EB-
Twin flashing



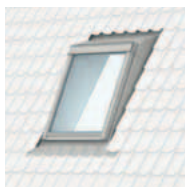
EK-
Combi flashing



EF-
Flashing for combined
roof/vertical window
elements



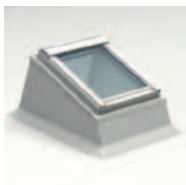
EE-
Flashing for roof
terrace



EA-
Kerb flashing



ET-
Flashing for additional
elements



ECX-TF
Insulated wooden kerb
for installation in flat
roofs



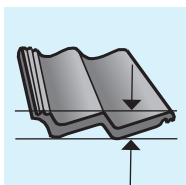
ZZZ 166
Flashing kit (4 mm
pleated aluminium roll)

Product information

Flashings

The third letter in the type designation indicates the types of roofing material in which the flashing can be installed. In case of profiled roofing materials, the profile height determines the choice of flashing, eg EDZ.

Below is an overview of the most commonly used flashings:



Profile height



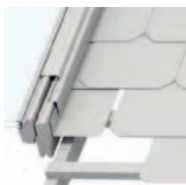
E-Z

For flat and profiled roofing materials with profile height up to 45 mm. Roof pitch from 20° to 90°



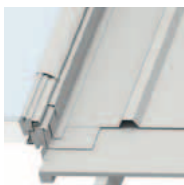
E-W

For flat and profiled roofing materials with profile height up to 120 mm. Roof pitch from 15° to 90°



E-L

For flat roofing materials with a thickness up to 8 mm. Roof pitch from 15° to 90°



E-E

For installation in traditional standing seam roofs

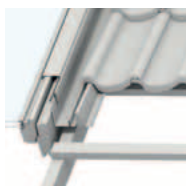


E-P

For plain tiles with a maximum thickness of 15 mm. Roof pitch from 25° to 90°

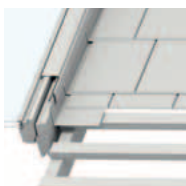
Installation in roofs with special roofing materials as eg thatched or grass roofs, see chapter 5 or contact VELUX Compagny Ltd.

As standard, VELUX flashings are made of grey, lacquered aluminium but they are also available in other colours or materials such as copper and zinc.



E-J

For profiled roofing materials with profile height up to 90mm. Roof pitch from 20° to 90°. The window is installed 40 mm deeper in the roof surface



E-N

As E-L, but the window is installed 50 mm deeper in the roof surface. Roof pitch from 35° to 90°



Recessed installation in profiled roofing materials with flashing EDJ



Recessed installation in flat roofing materials with flashing EDN

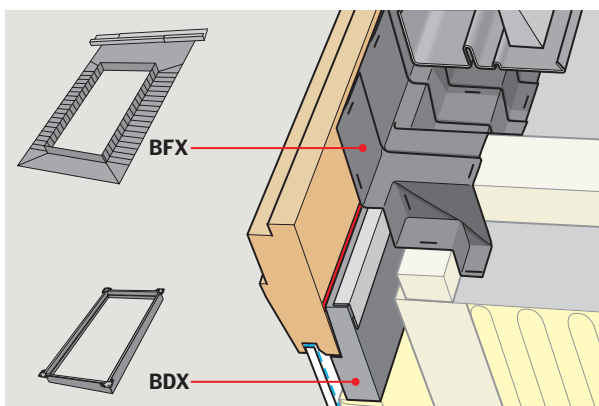
Product information

Installation products

VELUX installation products ensure connection to the underlying layers that are typically included in a roof construction, ie underfelt, insulation and vapour barrier (see chapter 7).

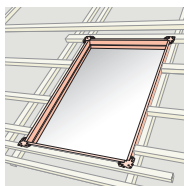
BDX 2000

Installation set consisting of frame insulation collar BDX and underfelt collar BFX with drainage gutter.



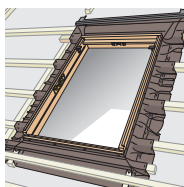
BDX

The frame insulation collar consists of shaped polyethylene insulation in a stable steel frame. The collar is positioned in the hole in the roof before the VELUX window is installed. This ensures an effective insulation around the frame.



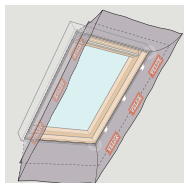
BFX

Underfelt collar of diffusion open material with pleated sides that are shaped around the battens to ensure a rain and snow-tight connection. Can also be supplied separately.



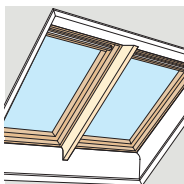
BBX

Polyethylene vapour barrier collar fitted in the window rebate and led to the interior ceiling/wall where it is connected to the vapour barrier of the roof/wall with tape supplied.



EBY/EKY

Support rafter of laminated wood provides support and interior finish between windows installed side by side with a frame distance of 18 mm (EBY) or 100 mm (EKY). EBY/EKY are available in two finishes, white foil for white finish polyurethane windows and clear lacquer for timber windows, and three lengths, 2000 mm, 2700 mm and 3500 mm.



EBY W10

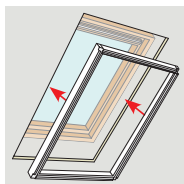
Adjustable support rafter of laminated wood.

EBY W10 is used for installation of combinations of roof/vertical window elements or for Roof Terrace System.

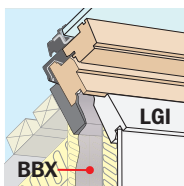
EBY W10 is available in two finishes, white foil for white polyurethane windows and clear lacquer for timber windows.

LGI

Frame extension of laminated wood (with a finish of clear lacquer or white paint). Fitted from the inside once the window has been installed.



If the installation does not include a VELUX lining, the frame extension can also be used to ensure sufficient space for insulation in the roof void above and below the window.



Product information

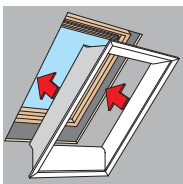
Linings

VELUX linings ensure an easy and quick connection of the window to the interior ceiling finish. The white, semi gloss surface and the white facings supplied ensure a harmonious connection from the window to most walls.

LSB/LSC/LSD

Standard linings to be used in roofs with a thickness of 125 mm to 500 mm and in roof pitches from 15° to 90°.

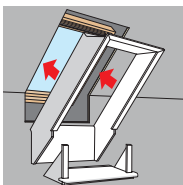
In roof pitches from 30° to 60° it is possible to install lining with horizontal top and vertical bottom. The linings are fitted and secured in the window rebate.



LEI

Vertical wall element to be fitted together with linings LSB/LSC/LSD in roof pitches from 30° to 60°.

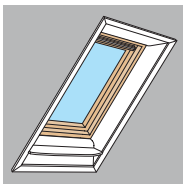
The supplementary kit consists of additional side sections and a window sill for installation in vertical wall. The sill depth is max 500 mm (see page 59).



LFI

Window sill to be fitted in linings LSB/LSC/LSD.

The sill is fixed to the bottom lining section. The sill depth is 270 mm.

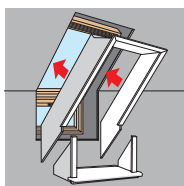


LVI

Supplementary lining to be fitted with linings LSB/LSC/LSD in roof pitches from 30° to 55°.

The supplementary kit is used for combinations with a roof window above a vertical window element.

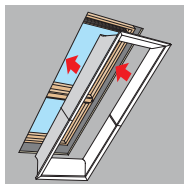
The supplementary kit consists of extra side sections and a window sill. The sill depth is max 300 mm.



LLB/LLC/LLD

Additional side sections to be fitted with linings LSB/LSC/LSD.

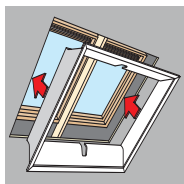
The supplementary kit is used for combinations of a roof window with an additional element GIL/GIU or GIV as well as for CABRIO® Roof Balcony System.



Special products

Linings are also available for twin installations with 18 mm frame distance.

These linings must be ordered as special products.



KRA 100

Frame lights KRA 100 are spotlights to be fitted in VELUX or on-site linings. To be used only in conjunction with roof windows GGL INTEGRA®/GGU INTEGRA® and not with GGL Solar/GGU Solar.



Product information

Electrical operation

Electrical operation of VELUX roof windows, sunscreening products and frame lights gives maximum comfort when operating products within and out of reach.

As the products are based on radio frequency (RF) technology, they can be operated from anywhere in the building with the same remote control. They can be operated individually and as a group.

You can choose an all-in-one electrically operated roof window GGL INTEGRA®/GGU INTEGRA® or a solar powered roof window GGL Solar/GGU Solar, see pages 116-117.

Alternatively, a manually operated roof window can, at the time of installation, be prepared for later upgrading to electrical operation, see page 24.



UPGRADING TO ELECTRICAL OPERATION

A manually operated centre-pivot window GGL/GGU can be upgraded to electrical function similar to an electrically operated window GGL INTEGRA®/GGU INTEGRA® by fitting electrical conversion kit KMX 100. The kit includes all parts necessary for electrical operation including remote control. The window operator is fitted into the window and connected with cable to the power supply.

Manually operated top-hung roof windows GPL/GPU/GHL/GHU can be upgraded to electrical function using electrical conversion kit KMX 200.

An alternative solution is to choose solar conversion kit KSX 100. The kit includes all parts necessary for electrical operation including remote control but does not require connection to the mains supply. Instead the solar cell supplies the window operator with power. Sunscreening products must be from the VELUX solar collection, eg VELUX solar roller shutter SSL.

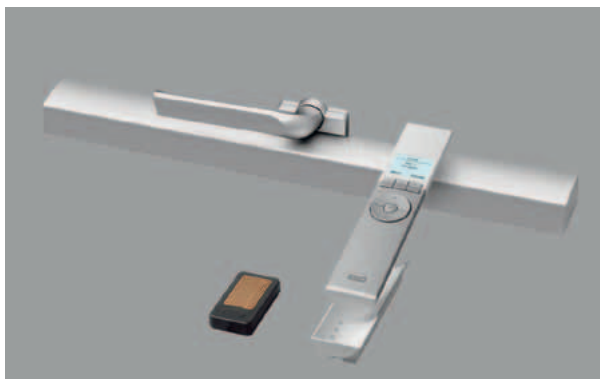


io-homecontrol® provides advanced and secure radio technology that is easy to install. io-homecontrol® labelled products communicate with each other, improving comfort, security and energy savings.

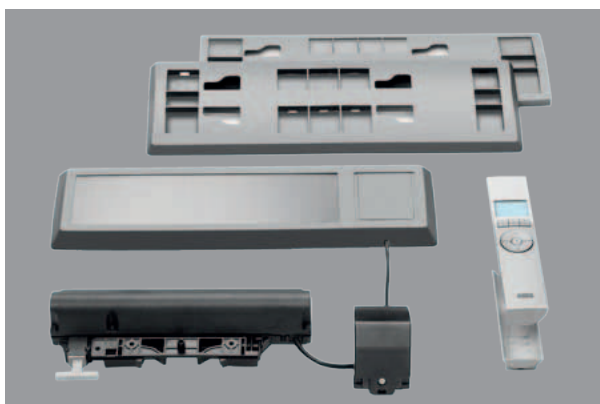
www.io-homecontrol.com



KMX 100



KMX 200



KSX 100

Product information

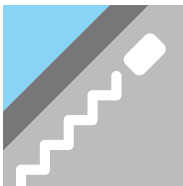
Blinds, awnings and shutters

VELUX roof windows are prepared for fitting of original VELUX blinds and external awnings or shutters. The products are designed so that fitting is both easy and quick and they are available in manual, electrical or solar powered versions (pleated and Venetian blinds are not available in solar versions).

For further product information, visit **www.velux.co.uk** or **www.velux.ie** where the VELUX blinds collection brochure may be ordered or downloaded.

PLEATED BLINDS

Provide privacy and a soft light in the room.



VENETIAN BLINDS

Control the amount and direction of light entering the room and protect against heat.



ROLLER BLINDS

Provide privacy and a soft light in the room.



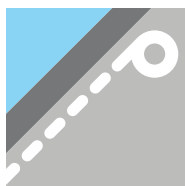
BLACKOUT BLINDS

Provide complete blackout and reduce both influx and radiation of heat.



INSECT ROLLER SCREEN

Keeps out insects but allows ventilation (not available in electrical or solar versions).



AWNING BLINDS

Prevent direct sunlight from reaching the insulating glass unit keeping rooms cool while at the same time allowing a view to the outside.



ROLLER SHUTTERS

Provide additional security, and effective daylight, heat and noise reduction from the outside plus additional thermal insulation.



Product information

Insulating glass units

The two last figures in the variant code indicate which type of insulating glass unit that is fitted in the window (eg GGL M08 3059). VELUX offers different types of insulating glass units for different purposes. The most commonly used insulating glass units are described below.

If other types of insulating glass units are required, please contact VELUX Company Ltd.



16 MM REPLACEMENT GLAZING (--59C)

16 mm insulating glass unit to be used to obtain a better insulating value when replacing the pane in old windows.



STANDARD ENERGY GLAZING (--59)

As standard, VELUX roof windows are supplied with a 24 mm low energy insulating glass unit with heat insulating coating and gas filled cavity. This unit comes with a toughened outer pane.



ENERGY GLAZING WITH FUNCTIONS (--73)

In addition to the features described for standard low energy glazing above (--59), this insulating glass unit comes with an inner pane of laminated glass for enhanced personal safety, UV protection against premature fading of furniture, better sound reduction and an outer coating which helps the window stay cleaner for longer.



OBSCURE GLAZING (--34)

In addition to the features described for standard low energy glazing above (--59) this insulating glass unit comes with an inner pane of 4 mm obscure glass. This makes it ideal for bathrooms as it provides privacy without reducing the amount of natural light.



ENERGY AND NOISE REDUCTION GLAZING (--60)

This glass unit combines all of the characteristics of the --73 variant but with an improved thermal performance and thicker toughened outer pane to reduce external noise level.



LOW ENERGY GLAZING (--65)

This glazing is recommended for new buildings with extra demands for heat insulation. This 33 mm gas filled low energy glass unit is triple glazed with two insulating coatings. In addition to the extra heat insulation this insulating glass unit has the same features as energy glazing with functions (--73).



HANDLING AND CLEANING PANES

Avoid any contact from silicone or sharp and abrasive objects with the outer pane. Never attempt to clean off dirt on the pane without first applying water. If any works are taking place in the vicinity of the pane, protect the pane with a clean plastic sheet to prevent any splashes or staining from aggressive and abrasive compounds. Clean water will normally be sufficient for cleaning the pane. Ordinary, non-abrasive household cleaners can also be used.

LAMINATED GLASS

Insulating glass units with laminated glass on the inside are recommended for roof windows installed at high level above areas where people sleep, play or work. Laminated glass consists of two or more layers of glass with a plastic foil (PVB) in between. In case of breakage, the lamination holds fragments together. Insulating glass units --73, --60 and --65 have laminated inner glass.

CLEAR AND CLEAN COATING

Activated by the UV rays of the sun, an invisible coating on the outside of the exterior glass of the window breaks down and loosens organic dirt that is then simply washed away by the rain therefore reducing the need to clean the window. Glazing with the clear and clean coating is recommended for roof windows installed out of reach.

The actual position of the window in combination with the weather may influence the effect. Insulating glass units --73, --60 and --65 have the clear and clean coating.

Other products

9

Sun tunnel	140-141
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Flat roof window	142-143
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Solar hot water system	144-145
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Other products

Sun tunnel

VELUX sun tunnels are complete installation kits delivered with all necessary components for both exterior and interior connections. An installation kit consists of three modules:

- Exterior rooflight module
- Tunnel (flexible or rigid)
- Interior light diffuser unit

The sun tunnel directs the natural light into areas of the house where installation of traditional VELUX roof windows is either not possible or not appropriate. It is recommended for corridors, storage rooms, toilets etc.

The sun tunnel is available in two sizes, 010 (Ø 250 mm/10") and 014 (Ø 350 mm/14").

Installation of a sun tunnel requires access to the attic. This does not apply to TCF that is designed for flat roofs with a roof thickness between 200 and 900 mm.



ROOFLIGHT MODULE

The choice of rooflight module depends on roof pitch and roofing material:

- **TCF** for flat roofs, roof pitch 0°-15°. Made of environmentally friendly PVC, with polycarbonate dome



- **TLF/TLR** for flat roofing materials such as slates, roof pitch 15°-60°. 4 mm toughened glass pane with clear and clean coating and integral flashing made of lacquered aluminium



- **TWF/TWR** for profiled roofing materials, roof pitch 15°-60°. 4 mm toughened glass pane with clear and clean coating and integral flashing made of polyurethane



TUNNEL

The tunnel is available in two types:

- a flexible fibreglass tunnel with a highly reflective surface (in **TCF**, **TLF** and **TWF**).
Maximum supplied length:
TCF = 1000 mm,
TLF/TWF = 2000 mm

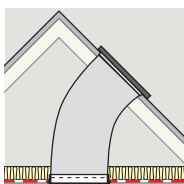
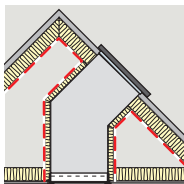


- a rigid aluminium tunnel with a highly reflective coating (in **TLR** and **TWR**).
Supplied length: 1085 mm

The rigid tunnel can be extended with extension section ZTR in lengths of 600 mm or 1200 mm.



Note! To prevent condensation problems, the vapour barrier must always be connected to the light diffuser unit.



LIGHT DIFFUSER UNIT

Seen from the inside, the sun tunnel ends in a frosted light diffuser discretely framed by a white ceiling ring.



Various accessories available, such as:

- ceiling trim rings ZTB in various colours
- light kit ZTL
- ventilation outlet ZTW for TWF/TWR



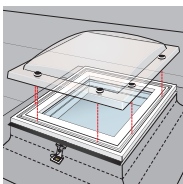
Other products

Flat roof window

VELUX Flat Roof Windows CVP/CFP have been specifically designed for installations into flat roofs (0°-15°).

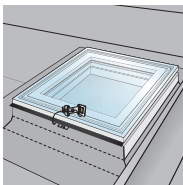


When ordering, please note that a flat roof window consists of a **window** and a **dome** which are ordered under one code but delivered as two separate items.



The **window** consists of a combined frame/sash made of white PVC fitted with an energy insulating glass unit --73 with toughened outer pane and laminated inner pane for safety. The window is flashed with the same material as the roof covering. The window is available in two types:

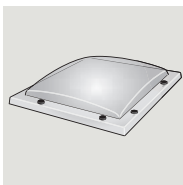
- **CVP** with opening sash and electrical remote control INTEGRA®
- **CFP** with fixed (not opening) sash



The polycarbonate **dome** is fitted on top of the window for additional protection, rain noise reduction and rain water drainage.

The dome is available in two variants:

- clear
- opaque

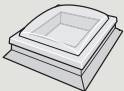
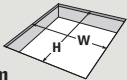


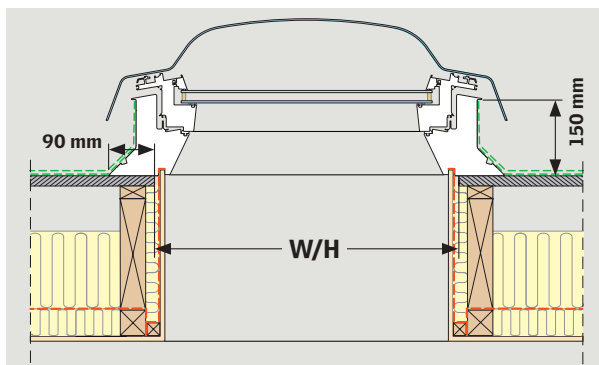
Other products

Flat roof window

9

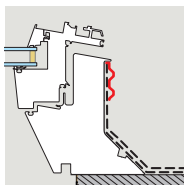
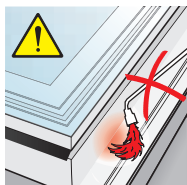
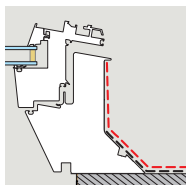
VELUX flat roof window is available in several sizes and can be used for replacement of existing dome lights.

		
	W mm	H mm
060060	600-610	600-610
080080	800-810	800-810
060090	600-610	900-910
090090	900-910	900-910
100100	1000-1010	1000-1010
120120	1200-1210	1200-1210



Installation hints:

- The design of the frame makes triangular lists unnecessary.
- Avoid direct contact between open burner flame and kerb!
- If the installation requires mechanical fixing of the roofing felt to the window frame, VELUX securing kit ZZZ 210 can be used.



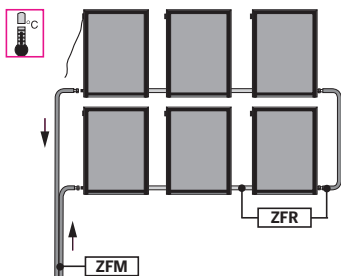
Other products

Solar hot water system

VELUX can deliver complete solar hot water systems that contain all necessary components for a complete installation.

SOLAR COLLECTOR CLI

- is available in various sizes and can be installed with VELUX roof windows using the same flashings.
- can be installed in roof pitches from 15° to 90°.
- is easy to install as solar collector CLI is fitted directly on the roof battens.
- is connected using stainless steel, insulated flex tubes ZFR and ZFM that can be hidden in the roof construction.

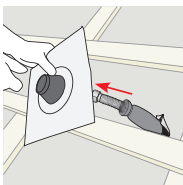
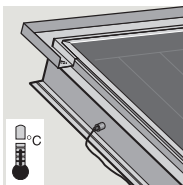


Principle for installation in the roof

Before closing the roof construction, it is important that the temperature sensor is fitted in the upper left corner of the last solar collector in the flow direction, and that the sensor cable is led to the hot water tank.

Note! The temperature sensor is delivered with the hot water tank.

Wherever flex tubes penetrate underfelt or vapour barrier, ensure tightness by using collars ZFT.



Other products

Solar hot water system

9

SOLAR HOT WATER TANK TFF

Solar hot water tank TFF is delivered complete with all necessary components for the solar hot water system.

- Hot water tank for vented or unvented installations
- Pump group with controller
- Expansion tank(s) with connection tube and holder
- Micro bubble air separator
- Temperature and pressure valves
- Glycol

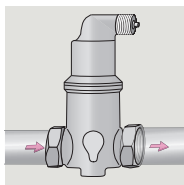


TFF is compatible with all supplementary heating units such as immersion heaters and gas/oil boilers.



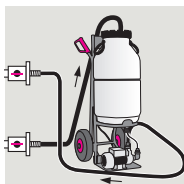
AIR BLEEDING

VELUX solar hot water systems do not require an air bleeding valve to be fitted at the highest point of the installation. Instead, the micro bubble air separator included is fitted on the hot flow from the solar collectors.



FILLING THE SYSTEM

The system must be filled and correct pressure ensured with a filling pump with high flow volume and pressure, eg VELUX filling pump ZZZ 197. For further information please contact the VELUX Company Ltd.



Contact VELUX

Addresses / Service

VELUX Company Ltd sells and markets VELUX products on the British and Irish markets.



Offices and **showrooms** are situated at the addresses below:

VELUX Company Ltd
Woodside Way
Glenrothes
Fife
Scotland
KY7 4ND

VELUX Company Ltd
Wellingborough Road
Kettering Parkway
Kettering
Northants
NN15 6XR

VELUX Company Ltd
Unit 1, Willsborough Cluster
Willsborough Industrial Estate
Clonsaugh
Dublin 17
Ireland

Contact VELUX

Addresses / Service

Technical Support

Telephone:

01592 778 225 (UK)

01 848 8775 (ROI)

Fax:

0870 380 9395 (UK)

01 848 8787 (ROI)

E-mail:

technical@velux.co.uk

technical@velux.ie

Service Support

Telephone:

01592 778 225 (UK)

01 848 8775 (ROI)

Fax:

0870 401 7961 (UK)

01 848 8557 (ROI)

E-mail:

service@velux.co.uk

service@velux.ie

Training Centres

Situated in Glenrothes, Kettering and Dublin

Telephone:

01592 776 980 (UK)

01 816 1617 (ROI)

Fax:

01536 510 411 (UK)

01 848 8753 (ROI)

E-mail:

training@velux.co.uk

training@velux.ie

List of telephone numbers

Technical Support (UK)	01592 778 225
Technical Support (ROI)	01 848 8775
Service Support (UK)	01592 778 225
Service Support (ROI)	01 848 8775

Notes

Size chart

Roof Windows					
			GGL 425 P25		
GGL 9 101 C01				GGL 601 S01	
GGL GGU					
102 C02					
GGL GGU GHL GPU GHU	GGL GGU GHL GPU GHU	GGL GHL GPU GPU GHU	GGL GHL GPU GPU GHU		GGL GHL GPU GPU GHU
6 C04	204 F04	1 304 M04	31 404 P04		7 804 U04
GGL GGU GHL GPU GHU	GGL GGU GHL GPU GHU	GGL GHL GPU GPU GHU	GGL GHL GPU GPU GHU	GGL GHL GPU GPU GHU	GGL GHL GPU GPU GHU
5 206 F06	14 306 M06	406 P06	4 606 S06		
GGL GGU GHL GPU GHU	GGL GGU GHL GPU GHU	GGL GHL GPU GPU GHU	GGL GHL GPU GPU GHU	GGL GHL GPU GPU GHU	GGL GHL GPU GPU GHU
	2 308 M08	408 P08	10 608 S08	8 808 U08	
	GGL GHL GPU GPU GHU	GGL GHL GPU GPU GHU	GGL GHL GPU GPU GHU	GGL GHL GPU GPU GHU	
	13 310 M10	3 410 P10	610 S10	810 U10	
	GGL				
	11 312 M12				

Sloped Fixed Additional Elements					
		GIL 334 M34	GIU 434 P34	GIL 634 S34	GIU 834 U34

Vertical Elements					
	VFE 1/4-60 331 M31	VFE 3-60 431 P31	VFE 4/10-60 631 S31	VFE 7/8-60 831 U31	
	VFE VFA VFB 1/4-95 334 M34	VFE VFA VFB 3-95 434 P34	VFE VFA VFB 4/10-95 634 S34	VFE VFA VFB 7/8-95 834 U34	
	VFA VFB 1/4-115 336 M36	VFA VFB 436 P36	VFA VFB 636 S36		
	VFA VFB 338 M38	VFA VFB 438 P38	VFA VFB 638 S38		

mm	550	660	780	940	1140	1340
cm	55	66	78	94	114	134

Flat Roof Windows					
CFP CVP 060060					
	CFP CVP 080080				
CFP CVP 060090		CFP CVP 090090			
			CFP CVP 100100		
				CFP CVP 120120	

mm	780	1140	1340	1140	1340
cm	78	114	134	114	134

CABRIO® Balcony	
GDL	
[Glass P10]	
252	
[Glass P04]	
410 P19	
94	

Roof Terrace	
GEL	
308 M08	
VEA VEB VEC	
335 M35	
78	

Sun Tunnels	
46	35
46	
TWR TWF TLR TLF	
014 14"	

37	25
37	
TWR TLR	
010 10"	

Flat Roof Sun Tunnel	
60	35
60	
TCF	
014 14"	

Solar Collectors		
CL1	4000 S06	
CL1	4000 M08	4000 S08
		4000 U12

mm	780	1140	1340
cm	78	114	134

Table shows external frame sizes. Please refer to installation instructions for trimmed opening sizes.

Bringing light to life

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